

GREELEY

2035 Comprehensive Transportation Plan



**Adopted
May 3, 2011**



Chapter 1: Introduction

Foreword	1-1
Purpose of the Plan.....	1-1
Why do we need a Plan?	1-2
What does the Plan address?.....	1-2
Planning Process	1-6
Public Outreach.....	1-7
Greeley Transportation Plan Goals.....	1-9

Chapter 2: Existing Transportation Conditions

Automobile	2-1
Existing Transit Service	2-12
Bicycle	2-14
Pedestrian.....	2-16
Rail System	2-19
Aviation System	2-19

Chapter 3: Future Growth

Growth in Households and Employment	3-1
Projected Travel Demand Patterns	3-2
Forecast 2035 Daily Traffic and Congestion.....	3-2

Chapter 4: 2035 Transportation Vision Plan

Integrating Land Use and Transportation	4-1
Maintenance	4-2
Master Streets Plan.....	4-2
Transit Vision Plan	4-13
Bicycle Vision Plan.....	4-16
Pedestrian Vision Plan	4-23
Hazardous Material Routes.....	4-24
Traffic Signal Design and Operation	4-24
Intelligent Transportation Systems (ITS)	4-26

Chapter 5: Implementation

Transportation Funding 5-1

Transportation Safety..... 5-11

Transportation Policies and Actions..... 5-11

List of Figures

Figure 1-1: City of Greeley Location Map..... 1-2

Figure 2-1: Existing Roadway Network 2-2

Figure 2-2: Signal Locations..... 2-5

Figure 2-3: School Zone Flashers 2-6

Figure 2-4: 2005 Base Year Daily Traffic Volumes and Congestion Levels ... 2-7

Figure 2-5: 2005 Base Year Intersection Levels of Service and Congestion . 2-9

Figure 2-6: Pavement Quality by Year and Cost of Maintenance 2-10

Figure 2-7: City of Greeley Pavement Quality Index 2-11

Figure 2-8: Fixed-route Transit Service 2-13

Figure 2-9: Existing Bicycle Network 2-15

Figure 2-10: Urban Areas Without Sidewalks 2-17

Figure 2-11: Pedestrian Network Examples..... 2-19

Figure 2-12: Rail Corridors 2-20

Figure 3-1: Distribution of Household Growth..... 3-4

Figure 3-2: Employment Growth..... 3-5

Figure 3-3: 2035 Daily Traffic Forecasts and Congestion Map 3-6

Figure 4-1: Master Street Plan Map..... 4-5

Figure 4-2A: Cross-Section – Major Arterials..... 4-7

Figure 4-2B: Cross-Section – Minor Arterials – 4-Lane..... 4-8

Figure 4-2C: Cross-Section – Minor Arterial – 2-Lane..... 4-9

Figure 4-2D: Cross-Section – Collector 4-10

Figure 4-2E: Cross-Section – Local Commercial and Industrial Roads..... 4-11

Figure 4-2F: Cross-Section – Local Residential Roads 4-12

Figure 4-3: 2035 Forecast Daily Traffic Volumes 4-14

Figure 4-4: City of Greeley Transit Vision Plan Service Map 4-15

Figure 4-5: Bicycle Vision Plan Map..... 4-18

Figure 4-6: Hazardous Materials Routes 4-25

Figure 5-1: Master Street Plan without State and Federal Improvements 5-4

Figure 5-2: Master Street Plan without State and Federal Improvements
2035 Daily Traffic Volumes and Congestion 5-5

Figure 5-3: The Minimum Roadway Improvement Alternative..... 5-6

Figure 5-4: 2035 Daily Traffic Volumes and Congestion Map 5-7

Figure 5-5: Greeley Street Pavement Quality Index by Funding Level and
Year 5-8

List of Tables

Table 2-1: Roadway Classifications 2-4

Table 3-1: Existing and Forecast Households and Employment - City of
Greeley's Growth Boundary Area 3-1

Table 4-1: Functional Classification Criteria Characteristics 4-3

Table 4-2: Recommended Minimum Bicycle Parking Requirements 4-22

Table 5-1: Greeley Transportation Plan Alternatives 5-2

Table 5-2: Characteristics of Transit Alternatives 5-10

Average Daily Traffic (ADT)
Colorado Department of Local Affairs (DOLA)
Downtown Development Authority (DDA)
Existing + Committed (E+C)
Federal Transit Administration (FTA)
Greeley-Evans Transit (GET)
Hazardous Materials (Hazmat)
Intelligent Transportation Systems (ITS)
Level of Service (LOS)
Metropolitan Planning Organization (MPO)
Neighborhood Traffic Calming Program (NTCP)
North Front Range (NFR)
Traffic Analysis Zones (TAZ)
Transportation Improvement Plan (TIP)
Union Pacific Railroad (UP)
University of Northern Colorado (UNC)
Vehicle Miles Traveled (VMT)
Volume-to-Capacity Ratio (v/c)

Chapter Contents

- Foreword
- Purpose of the plan
- Why do we need a Plan?
- What does the plan address?
- Planning Process
- Public Outreach
- Greeley Transportation Plan Goals

Foreword

The City of Greeley is the county seat and the most populous City of Weld County, Colorado. Greeley is approximately 50 miles north of the Colorado State Capitol in Denver. Greeley has a population of approximately 95,000 and is the 12th Most Populous City in the State of Colorado.

The economic and cultural diversity of Greeley contributes to a quality-of-life that residents enjoy. Greeley not only is an economic hub within the region, but is also an educational hub with such institutions as the University of Northern Colorado (UNC) and Aims Community College. As a result, the City has experienced steady growth and economic prosperity over the years, and is expected to continue to grow during the coming years. With forecast growth come the pressures of maintaining an infrastructure system that accommodates past and future growth.

Understanding how the existing transportation system (which includes roadways, bicycle facilities, sidewalks and transit) operates today coupled with its projected growth, provides the framework for the development of the City of Greeley's Comprehensive Transportation Plan. Understanding the travel patterns between Greeley and the region is also important since some residents who live in Greeley travel to the neighboring cities of Fort Collins, Loveland, Windsor and other communities and, conversely, residents of those cities travel to the City of Greeley. As the City's transportation infrastructure increases, it also becomes more critical to maintain these assets.

The ability for residents and businesses to reach their destinations easily demands a well-maintained and balanced transportation system. A balanced transportation system requires the development of a multi-

modal system that provides the Greeley resident choices in transportation.

The development and implementation of this plan must also deal with the realities of the present fiscal constraints. Yet, it must give the City a sense that future opportunities to provide for needed services do exist to strive for given, difficult economic times that face families, businesses, and the government agencies.

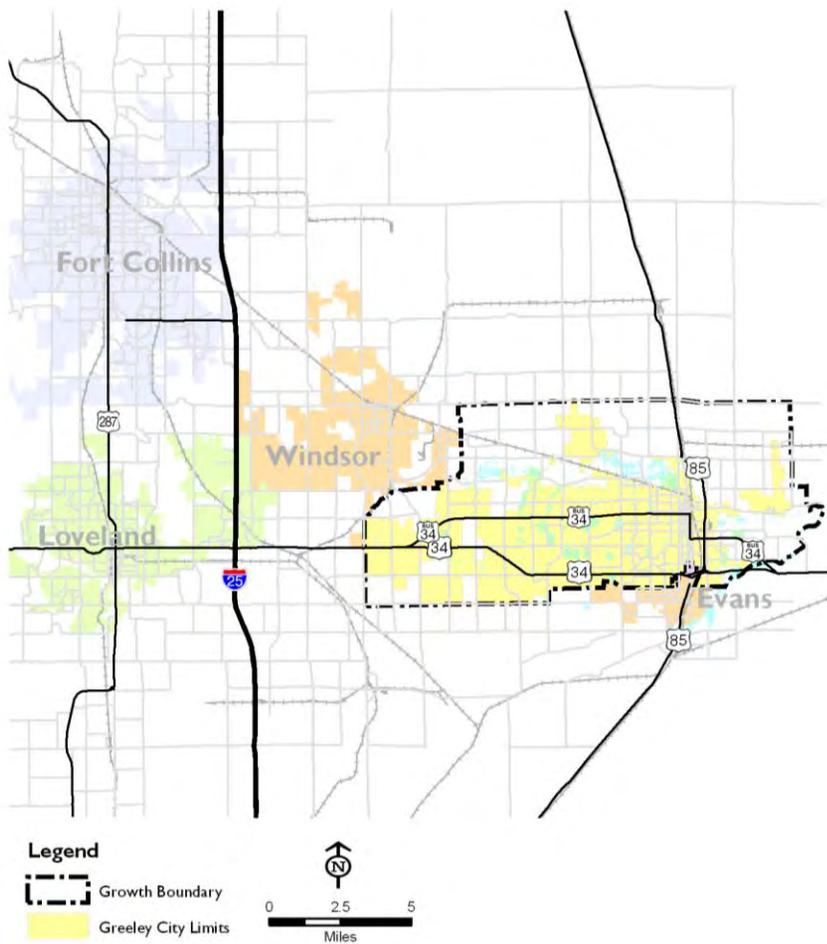
To address these issues, the City of Greeley 2035 Comprehensive Transportation Plan begins with an overview of the purpose of the plan, why it is being updated, and what the plan addresses. This overview also presents the process for the development of the plan, the public outreach, and the plan goals. Figure I-1 shows the boundary of Greeley in context with the North Front Range.

Purpose of the Plan

The Greeley 2035 Comprehensive Transportation Plan defines the long-range vision for a multi-modal transportation system that offers choices in how people travel, supported by a realistic plan to fund and implement improvements.

The transportation plan responds to the recently completed update to the City's 2060 Comprehensive Plan and vision for growth. The plan addresses the relationship between transportation and land use, and it identifies future transportation needs of the area, estimates costs, and identifies short-term and long-term improvements for roads, transit, bicycle, and pedestrian facilities. The plan provides both technical and policy direction for decisions related to planning transportation facilities. The plan also provides the framework for a balanced transportation system that offers choices in how people travel and is supported by a realistic plan to fund improvements.

Figure 1-1: City of Greeley Location Map



Why do we need a Plan?

The City of Greeley needs a long-range transportation plan for several obvious and some not-so-evident reasons.

A great number of transportation and land-use changes have taken place in Northern Colorado since the last update in 2002 and the new plan needs to reflect these changes. As congestion increases on area roads due to growth, development, and more travel through the region, it is clear that the current roadway system will not be sufficient to accommodate future needs. In addition, the citizens of Greeley have expressed interest in alternative transportation modes.

Beyond any of these reasons, a long-range transportation plan benefits the community because it helps plan for the future of Greeley. Good planning involves citizens, increases efficiency and effectiveness of the investment, and promotes transportation services and infrastructure that are consistent with the community’s desires. The planning process enhances the community’s character and quality-of-life by considering the interaction between land use and transportation and their cumulative effect on the built and natural environments.

What does the Plan address?

The City of Greeley 2035 Comprehensive Transportation Plan does not simply address growth and demand, but a wide range of influences which impact the transportation system and, conversely, affect the residents and businesses of the City of Greeley. In general, there are five broad categories of issues to address: sustainability, quality-of-life, growth and development, congestion, and funding.

Sustainable Transportation

Sustainable transportation concerns systems, policies, and technologies. It aims for the efficient movement of goods and services and for sustainable freight and delivery systems. The design of roadways with minimum congestion, along with pedestrian and bicycle friendly design of neighborhoods is a critical aspect for a sustainable transportation system.

Access

Access to people, places, goods, and services is important to the social and economic wellbeing of the City of Greeley. Automobiles should not be the only means through which access can be achieved. Access should be improved by transportation options, giving people more choices as to how they meet their access needs.

People and Communities

The City of Greeley's transportation system is a critical element of a strong economy and contributes directly to building the community and enhancing quality-of-life.

Environmental Quality

In order to minimize impacts to habitats and reduce consumption of resources to a rate that can be regenerated or replaced, efforts must be made to develop the City's transportation systems which will minimize physical and environmental stress, minimize vehicle miles of travel, and respecting the environment.

Economic Viability

Sustainable transportation systems must be cost effective and affordable. Above all, the City needs to first maintain what they already have. The funding for transportation should be equitably shared between new development and the existing population.

Quality-of-Life

Community

Transportation can affect the quality-of-life of our communities in many different ways. Whether it is the wasted time spent on inadequate facilities, the perceived or real lack of safety, the environmental impacts, or the lack of aesthetics along travel routes, these factors affect the desire to live in a particular community. On the other hand, if positive quality-of-life factors can be incorporated into a transportation network, this can translate into a more thriving and dynamic community with a true sense of pride.

Visitor Impressions

Not only does transportation affect the Greeley resident, but it also affects visitors' perceptions to Greeley. It is Greeley's transportation network that will make the first impression on out-of-town travelers. The desire for businesses and residents to relocate to Greeley can be driven by positive quality-of-life factors.

Growth and Development Issues

Population and Employment Growth

Based on the Colorado Department of Local Affairs (DOLA), the number of households in the City of Greeley is projected to double from the 2005 base year to 2035 from approximately 31,000 households to 64,000 households. City employment is projected to grow by a similar magnitude, from about 50,000 jobs in 2005 to 88,000 jobs in 2035. These trends are also expected in other North Front Range communities surrounding Greeley.

Land Use Mix and Urban Form

Land use patterns in Greeley are directly related to not only the amount of travel, but the choice of modes that people select. For example, higher density communities in the region generate a higher proportion of transit riders. As such, land use planning strategies identified in the recently completed City of Greeley 2060 Comprehensive Plan propose higher density, mixed-use areas that improve the attractiveness and cost-effectiveness of alternative modes of travel.

Transportation Planning and Safety

Travel safety is repeatedly identified as being one of the most important characteristics of transportation system performance. Similar to other issues that are linked to the construction and operation of transportation facilities (e.g., air quality, economic development, etc.), travel safety is clearly an issue that can be affected by how the transportation system is designed, constructed, operated, and maintained.

Based on a study prepared by the National Cooperative Highway Research Program, Incorporating Safety into Long-Range Transportation Planning, a number of critically important findings were identified that relate transportation and safety. These include:

- The costs associated with motor vehicle-related fatalities and vehicle accidents are staggering.
- Motor vehicle fatalities and crashes are a leading public health problem in the U.S., and indeed, in the world. Crashes are the leading cause of death in the United States for those under the age of 34 and were a top 10 cause for all other age groups.
- Areas struggling with congestion, crashes represent a major source of congestion (referred to as “non-recurring” congestion). In busy rush hours, the time it takes police and/or

emergency services to reach a site, clear the vehicles from the travel lanes, collect any relevant crash-related data, and remove disabled vehicles from the roadway can lead to monumental traffic delays on critically important roads.

- Many crashes are preventable. In the U.S., approximately 30% of motor vehicle fatalities and 72% of the motor-vehicle-related injuries involve speeding. Collisions with fixed objects were a characteristic of 27% of fatalities and 15% of injuries. Just over 39% of fatalities involved drugs or alcohol. A comprehensive program or strategy dealing with the causes of motor vehicle crashes could have a significant benefit to society.

Safety as traditionally defined means achieving a trip purpose without incurring personal harm or damage to property for all travel modes. To address safety as part of the City of Greeley 2035 Comprehensive Plan, the Plan incorporates roadway design standards that improve safety for all users, including automobile, transit, bicycle, and pedestrian. The Plan goes beyond the improved transportation project designs and includes what engineers refer to as the five E’s: Engineering, Education, Enforcement, Encouragement, and Evaluation.

The practices listed below were determined to constitute best practices by the FHWA, and for the purposes of this guidebook, provide some guidance on the characteristics of effectively incorporating safety into transportation-planning.

Safety is a major goal of the City of Greeley 2035 Comprehensive Transportation Plan. The Plan elements promote multimodal safety by designing a transportation infrastructure that reduces the number and severity of traffic crashes by ensuring that all opportunities to improve highway safety are identified, considered, implemented as appropriate, and evaluated in all phases of highway planning, design, construction, maintenance, and operation.

Congestion

System Delay

Average trip time in the North Front Range region has increased significantly in the past two decades. Traffic congestion reduces travel speed and increases travel time on our roads. Longer delays lead to driver frustration, more pollution, and higher travel costs for both commuters and goods movement.

Traffic Diversion to Local Streets

Road classification designates arterial roads for longer distance travel, while collector and local roads are generally meant for use by local traffic. As traffic congestion increases on the major routes, motorists tend to look for shortcuts to get around the increasingly congested locations. With a grid street system, these shortcuts often are on local neighborhood streets.

Cost for the Movement of Goods and Services

Traffic congestion not only impacts the commuter, it also slows down the movement of goods on trucks, as well as other road-based services. Traffic congestion can add significantly to the cost of moving these goods and services and can influence the overall economic activity in the City. Inevitably, these increased transportation costs are passed on to the consumer in the form of higher prices.

Maintenance

Greeley continues to invest in new community infrastructure to support a growing and thriving community. The question asked is how should the City prioritize the maintenance of the current infrastructure and its eventual replacement, given the demand for expanded infrastructure and the limited financial resources available?

Funding

Over the next 25 years, Greeley will need between \$300 million and \$700 million in roadway transportation infrastructure, roadway maintenance and transit service. The challenge is to acknowledge the limitations in financial resources and prioritize the most critical improvements.

Financing City Infrastructure

The City's capital financing strategies need to be premised on the fact that the demand for community transportation infrastructure, both growth-related and sustaining existing assets, far exceeds the City's ability to finance these needs. Not all of the services or projects that the community values will be within the City's means to provide. The financing of growth-related transportation infrastructure is, and will continue to be, an important issue within the community. There are various funding options, each with its advantages and disadvantages.

Focus on Pay as You Go (Annual Taxation)

There continues to exist a significant backlog of maintenance and rehabilitation projects, as well as inadequate funding for day-to-day maintenance.

Grants from Other Governments

Although federal and state government grants and revenues have decreased in recent years, the City must actively pursue grant opportunities regionally, through the state and federal programs.

Development Cost Charges

Greeley’s development fees for residential and commercial uses are below the average for the North Front Range area. These fees must be continually monitored to ensure that they are consistent with, and adequate to meet, current policy decisions on transportation, land use, finances, and economics.

Transportation Choices Affecting the Future

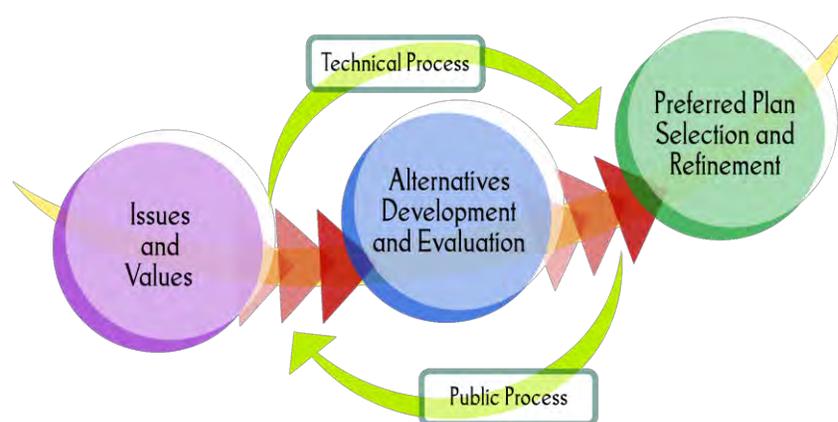
No other community feature influences land use decisions, city design, and function more than its transportation system. With as much as 20% of the City’s land area devoted to roadways, transportation can also represent both a significant community cost and a design opportunity. Roadways have multiple functions with safe movement ranking as the primary objective. With so much of the community’s land area devoted to its transportation system, streets need to be both functional and attractive. Entryways welcome visitors and convey community values and priorities. Major corridors not only access adjacent businesses and housing developments, but reflect the community’s quality-of-life standards as well. The creative design of the City’s sidewalks, bicycle lanes, street corridors and intersections, medians, traffic signals, and street signs can add significantly to a positive community image. The City’s transportation system must also be an effective link between other regional transportation systems and networks, including state highways, rail, and airport facilities.

What questions does the Greeley Comprehensive Transportation Plan answer?

- How does the City’s 2060 Comprehensive Plan affect the need for transportation facilities in the City?
- What transportation improvements are needed to serve the future growth of Greeley?
- What are the capital investment needs for Greeley to meet future transportation demand?
- How will the transportation needs be prioritized?
- What are the best ways to fund needed improvements?

Planning Process

The planning process consisted of three phases: Issues and Values, Alternatives Development and Evaluation, and Preferred Plan Selection and Refinement.



Issues and Values

The Issues and Values phase of the work effort included an evaluation of the existing transportation system (Chapter 2). This included an assessment of the current roadway network, daily traffic volumes, arterial and intersection level of service, a review of the existing sidewalk and bicycle network, and transit service. The issue of street maintenance was also addressed. Based on the existing conditions assessment, a public meeting was held to determine the concerns of the community and what people would like to see contained in the transportation plan.

Alternatives Development and Evaluation

A number of alternatives were developed for each of the various transportation modes. These alternatives were based on future 2035 traffic forecasts, using both regional and City of Greeley 2060 Comprehensive Plan population and employment forecasts.

Preferred Plan Selection and Refinement

The preferred plan included refinements to the alternatives, which involved coordination with other jurisdictional plans for consistency. These plans also examined various funding levels, identifying what the priority projects are, given different funding strategies.

Public Outreach

In order to incorporate meaningful public input into the transportation planning process, the City of Greeley hosted two rounds of public meetings to solicit input to the plan to understand their issues and concerns, and for plan review. Subsequent to these two rounds of public meetings, an additional round of meetings was held to get input from various community groups.

Public Meeting 1: Issues and Concerns

A community meeting was held on September 10, 2009 to solicit from the public their issues and concerns regarding transportation within the City of Greeley. Two events were held, with the first meeting during the afternoon at the Greeley Ice Haus, and the second in the evening at the Family Fun Plex.

The meeting objectives were to provide an overview of the state of transportation and mobility within the City, elicit ideas for improving transportation in Greeley, and help plan how and where we travel in the future. Public input included ideas and opinions on what new roadways should be built, how transit service can be enhanced, what bicycle and pedestrian options need to be explored, and what funding priorities will best support our quality-of-life in the future.

The event included an opening presentation on current transportation conditions and future trends, followed by an exercise to plan Greeley's future transportation system within a set budget. The exercise, called "CONNECTIONS," mirrored the challenges and opportunities that elected officials and public agencies face in planning future transportation that works for all.

Based on the existing conditions analysis and stakeholder input from the public workshop, there are a number of key issues and concerns that need to be addressed in developing transportation alternatives and selecting a preferred 2035 Transportation Plan for the City of Greeley. These are summarized as follows:

- **Funding:** The number one issue facing the City of Greeley in providing a transportation system for the City's future is the lack of funding for all transportation programs. While the demand for transportation funding increases, available funding is decreasing.

Summary of Key Messages

- The City's street system generally operates well, with minor areas of congestion.
- Annual funding for roadway maintenance is over \$5 million less than what is needed.
- Transit coverage and service to downtown is generally adequate, but service for much of the City is not available.
- The existing bicycle network does not provide a system of connection; however, the residential street system provides for some bicycle opportunities.
- The pedestrian system in the downtown and older neighborhoods is good, but newer residential areas and crossing major arterials both impact pedestrian opportunities.
- Population will nearly double in the next 25 years, with a 250% increase of those over 65. This growth will increase demand for transit.
- Household and employment growth will continue primarily in west Greeley.
- Without major roadway improvements, severe congestion will occur within the City.
- The City of Greeley's transportation needs for transit, transportation (signals, signs & pavement markings), pavement maintenance and new roadways are extremely under budgeted.

- **Maintenance:** The City roads are getting older and they are deteriorating at an ever-increasing rate. The lack of maintenance dollars is a current crisis which will continue to grow and cost the City more in the future if not addressed today.
- **State and Federal Funding for Capacity Improvements:** Historically, the City has received funding to provide for capacity improvements on state and federal roadways, such as the US Hwy 34 Bypass and Business Route and US 85. Current state and federal transportation funds are virtually non-existent, with what few dollars remain being allocated to state and federal roadway maintenance and safety improvements.
- **Transit:** Currently, the City receives transit capital and operations funding from the Federal Transit Administration (FTA). With increased population, the City may likely lose some

FTA transit operations funding. This will occur at the same time the City is growing and requires even more transit or face lack of services for seniors, those with disabilities, and the youth.

- **Bicycle and Pedestrian Improvements:** Although the City has a fairly good pedestrian system, there are pedestrian needs for growing areas and for crossing arterial streets. The bicycle network does not provide a system of paths, lanes, or routes that connects the City, nor does it provide the City's residents a viable bicycle transportation choice or recreational bicycle opportunities.

Public Meeting 2: Plan Review

A second round of community meeting was held on July 12, 2010 to review the draft City of Greeley Comprehensive Transportation Plan at the City of Greeley's Recreation Center. This workshop presented the transportation plan elements for roadway, transit, bicycle and pedestrian, maintenance and funding. The objective of this meeting was to respond to questions and comments and solicit any suggested changes.



Greeley Comprehensive Transportation Plan
Draft Plan Open House

What are the Transportation Plan priorities?
How will they affect you?
Did we get it right?

Find out at the Draft Plan Open Houses on
Monday, July 12th, at the Greeley Recreation Center
(651 10th Avenue) and share your comments.

Pick either the afternoon or evening session:
• 11:00 a.m. to 1:00 p.m. - Presentations at 11:15 a.m. and 12:15 p.m.
• 5:00 to 7:00 p.m. - Presentations at 5:15 p.m. and 6:15 p.m.

These meetings are open houses so you can stop in anytime or come for one of the scheduled presentations listed above.

GREELEY
Comprehensive Transportation Plan

The right direction for our City:
Smart transportation
supporting economic vitality and
a healthy community.

- Basic Transit Service
- Maintaining Existing Roads
- Funding Options
- Critical Biking Connections
- Strategic Roadways

Additional Public Meeting Outreach

After the presentation of the Draft City of Greeley Comprehensive Plan to the City of Greeley City Council in December 2010, the City Council requested that the plan be presented to various community groups for additional opportunity for public review and comments.

The groups that were presented to and dates are listed below:

- Agland Petroleum – Wednesday February, 23rd
- Greeley Board of Realtors and Builders – Wednesday March 2nd
- Greeley Centennial Rotary Club – Thursday March 24th
- Greeley Golden Kiwanis’s Club – Tuesday April 5th
- Greeley Red Eye Rotary – Tuesday April 12th
- Greeley Lions Club – Monday April 18th

Greeley Transportation Plan Goals

The City of Greeley 2035 Comprehensive Transportation Plan is an update to the 2020 Transportation Plan. As part of the 2020 transportation plan process, a mission statement and transportation plan goals were developed and approved. These goals remain virtually intact for the development of the 2035 Transportation Plan.

Mission Statement: To plan and implement a safe, efficient, continuous, coordinated, and convenient multi-modal transportation system that serves the needs of the users in the community.

The plan’s specific goals are:

- I. To develop transportation policies that contributes to the improvement of the environment and the travel experience in the community.

Summary of Public Comments

A summary of the comments received at the additional public meetings included:

- Signal timing throughout Greeley was a general comment, although many had noticed that major corridors in Greeley have been timed much better.
- Road maintenance was discussed in each meeting and each group thought that finding a way to fund the maintenance of Greeley’s roadway network should be a top priority.
- One group felt that development fees were already too high and is limiting Greeley’s growth.
- Talk of roundabouts brought some mixed feelings, but as a whole, most people in all the groups felt roundabouts would serve Greeley in the future. The only concerns were of those of large trucks and the elderly community.
- Many people were glad to see more East/West routes to relieve some of the congestion on Hwy 34 & 10th Street.
- Several transit questions were brought up ranging from how much of the transit budget is collected in fares, to will future transit better serve the aging community by traveling more often to medical centers and pharmacies.
- Efforts need to be made to complete the City of Greeley’s bike system.
- Every group felt that road diets were an effective way to make roadways more multi-modal.
- The O Street project is critical to relieving traffic along the US 34 Corridor.
- Roundabouts are an excellent opportunity to provide entryway/landscaping to the community. We should be pursuing their construction.
- The City should really be working on major entryway features to improve the image of Greeley.
- Road maintenance funding is a major issue facing the community and we need to continue to pursue funding opportunities.

2. To recognize the interrelationship between land use and transportation planning and to encourage transportation planning that complements economic development and is consistent with the City of Greeley 2060 Comprehensive Plan and the plan's Land Use Guidance Map.
3. To develop collaborative transportation strategies with neighboring communities through Intergovernmental Agreements.
4. Promote increased opportunities for pedestrians, bicyclists, and transit, and reduce vehicle miles traveled (VMT).
5. Identify and recommend Access Management Policies, Roadway Design Standards, and Traffic Calming options that protect the safety and carrying capacity of the multi-modal transportation network.
6. Develop a plan and an implementation strategy that recognizes funding parameters and aggressively seeks alternative sources to enhance funding resources.
7. To include an ongoing process of review and research to ensure that the Transportation Plan remains consistent with the evolving needs of the community and applicable City-wide plans, i.e., water, sewer, Comprehensive Plan, Adequate Public Facilities Plan.

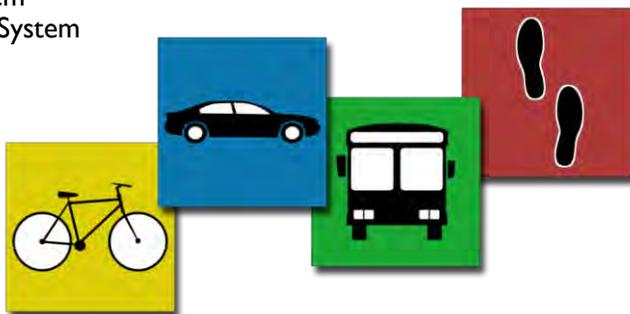
Chapter Contents

- Automobile
- Existing Transit Service
- Bicycle
- Pedestrian
- Rail System
- Aviation System

To many, the transportation system is often viewed as a network of streets and roadways that allow automobiles and trucks to travel within, to, and through the City of Greeley. In reality, roads make up only one component of the transportation system, although a very important one. Transit service and bicycle/pedestrian facilities are essential to a well-balanced multi-modal transportation system.

To understand how the transportation system operates in the Greeley area today, an inventory and analysis of those elements comprising the existing transportation system was conducted. Analyzing the existing transportation conditions is an integral step of the planning process to identify areas in need of improvement over the 25-year planning period. The transportation system in Greeley is not unlike that of other cities that have similar density and proximity to an urban core/employment center, where the dominant means of transportation is the automobile. However, it is essential that all modes of transportation are examined and improved as each comprises an important part of the transportation system. Therefore, data was gathered on the following modes of transportation:

- Roadway Network
- Transit System
- Pedestrian/Bicycle Facilities
- Rail System
- Aviation System



Automobile

The automobile has been and continues to be the predominant mode of travel in Greeley, the region, the state, and our nation. We travel along our local streets and interstates for trips to work, shopping, business, and recreation. This infrastructure is also critically important in that it provides the system for delivering our goods and services, providing emergency response services, and supporting the bus system.



Roadway Network

The existing City of Greeley roadway network is presented in Figure 2-1. As can be seen, the network is made up of various types of roadways with different classifications. These classifications of roadways have different purposes and carry different volumes of traffic. The roadway classifications include Freeway/Expressway, Major Arterials, Minor Arterials, Collectors, and Local Streets.

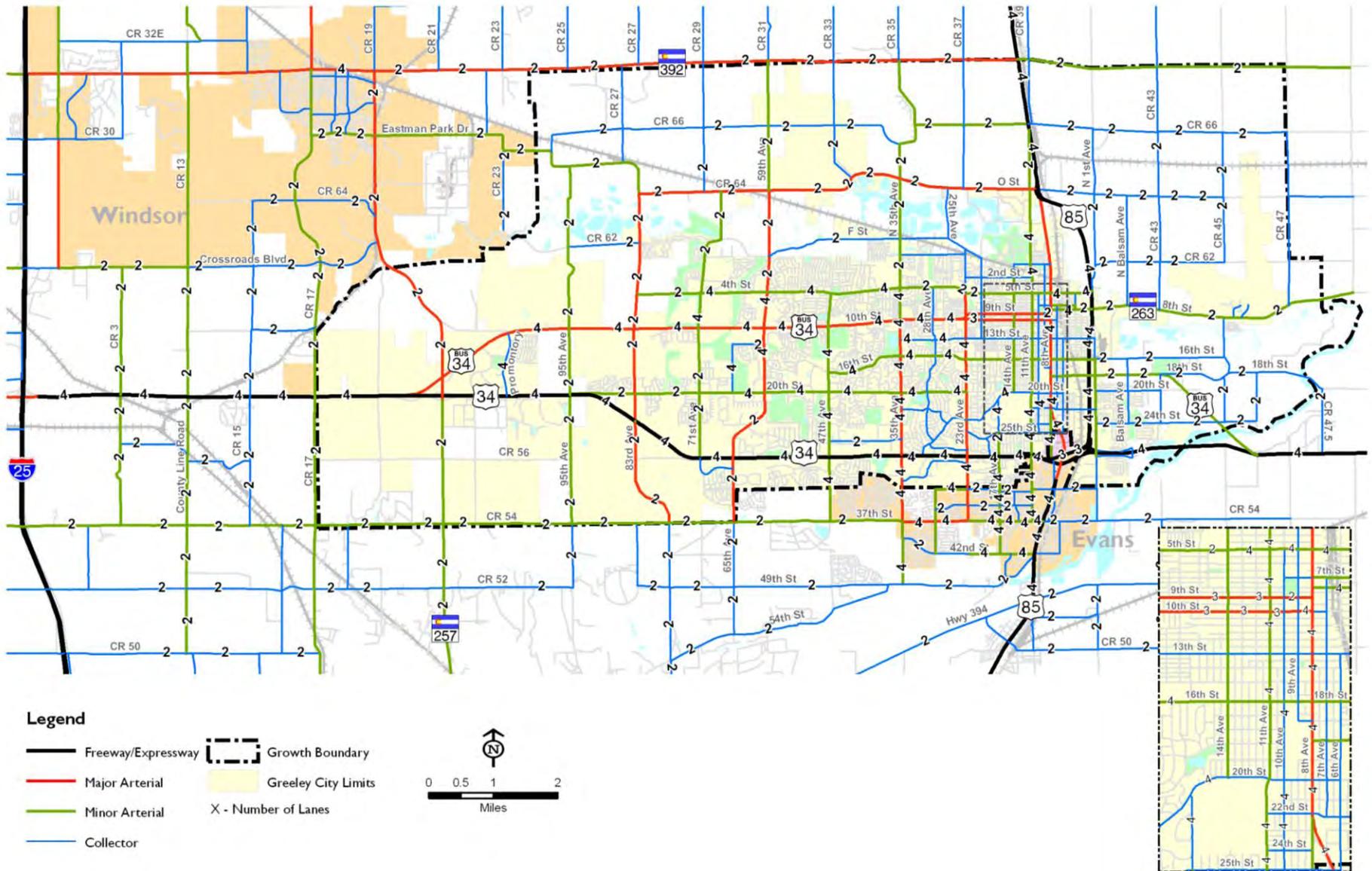
The backbone of the existing roadways is the US 34 Bypass, Business Route US 34, US 85, and I-25 to the west. The roadway network provides for a strong grid system, which provides many alternative routes for travel throughout the City.

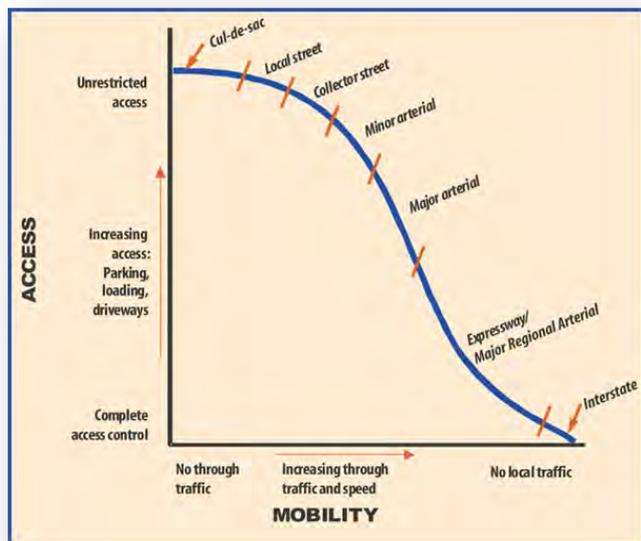
These major facilities are supported by other Major Arterials, Minor Arterials, and Collector Streets which provide local connections and serve the region's existing uses. Functionally, Major Arterials and Freeways have higher travel speeds and controlled access, whereas Minor Arterials, Collectors, and Local Streets have slower travel speeds and increased access.

Roadway Functional Classification

The roadway network is based on a range of different types of facilities with varying characteristics that, when combined, make up the roadway system. These facilities range from Freeways/Expressways which serve high-speed, longer-distance trips, to Local Streets that are designed for lower speeds and shorter trip lengths. Two important variables which define roadway function are mobility and access.

Figure 2-1: Existing Roadway Network





Freeways have full access control that allows vehicles to enter and exit only at interchange ramps since mobility is the primary function of a Freeway. Local Streets, on the other hand, have numerous driveways and connections because their primary function is to provide local access to businesses and residences. Table 2-1 provides a basic definition for each road classification.

In Greeley, there are a greater number of opportunities for north-south travel than there are for continuous east-west travel. This is primarily because many of the major east/west roadways, such as 13th Street, 16th Street, and 20th Street are discontinuous.

Traffic Signals and School Zone Flashers

In addition to the street network, there are signalized intersections, stop signs, and school zone flashers which regulate the movement of traffic along these roadways. As shown in Figure 2-2, there are currently 113 signalized intersections within the City. It should also be noted that the City has a history of removing signals when they are no longer warranted.

Presented in Figure 2-3 are the locations of school zone flashers in the City of Greeley. The downtown area has the most concentration of signalized intersections. Additionally, the more heavily traveled roadway corridors (such as 10th Street, 16th Street, 8th Avenue, 11th Avenue, 23rd Avenue, and 35th Avenue) have a greater number of signals.

Almost all of the City’s signals are traffic actuated. Optimizing the signal timing of all the signals in Greeley allows for greater functionality of individual signals and increases their capabilities to function as part of an integrated system, thereby, decreasing overall system delay.

Traffic Volumes and Patterns

As part of this study, average daily traffic (ADT) counts were collected at various locations throughout the City for the base year 2005 conditions. These ADT counts are presented in Figure 2-4. Volumes are presented with a number which depicts 1,000 vehicles per day and by band width, where the wider the band, the higher the volume.

Generally consistent with the functional classification of the system, the higher traffic volumes are experienced on the Expressways and the Arterial Streets. The heaviest volumes exist on US 34 Bypass and on US 34 Business (10th Street). Because the City of Greeley is linear from east to west, there are greater opportunities for north-south travel. Therefore, the traffic volumes in this direction are more uniformly dispersed over a greater number of streets than are the volumes in the east-west direction.

Table 2-1: Roadway Classifications

Freeways/ Expressways	Major Arterials	Minor Arterials	Collectors	Local Streets
<p>The Freeways/Expressways within the Greeley region include I-25, US 85, and the US 34 Bypass. They provide for the high-speed movement of large volumes of traffic with minimal interference. This is accomplished through the use of access control, divided roadways, and grade-separated interchanges. Interstates have the inherent characteristic of lower accident rates because of many built-in safety features, such as comfortable alignment, easy grades, speed change lanes, adequate sight distance, and other geometric features that afford a continuous movement of traffic.</p>	<p>Major Arterials provide a high-level of mobility at higher speeds for the longest distances. Access should be controlled with a limited number of intersections, medians with infrequent openings, and no direct parcel access, depending on use and geographic setting. Existing and future land uses adjacent to Major Arterials shall be served by other network roadways, service roads, and inter-parcel connections.</p>	<p>Minor Arterials are streets that serve moderate-speed and higher-volume traffic over medium distances. Access should be restricted through prescribed distances between intersections and limited direct parcel access. Minor Arterials serve major traffic generators and link Collector streets with the Major Arterials.</p>	<p>The Collector street system serves intermediate- and short-distance travel. Collectors provide a lower level of mobility than arterials at lower speeds. These streets connect local roads to arterials and have more direct access, dependent on use and geographic setting.</p>	<p>This is the lowest classification of streets. Local Streets provide a high level of access to abutting land but limited mobility. Local Streets function primarily to serve local traffic circulation and land access. These streets customarily accommodate shorter trips and have lower traffic volumes and lower speeds than do Collectors and Arterials.</p>

Figure 2-2: Signal Locations

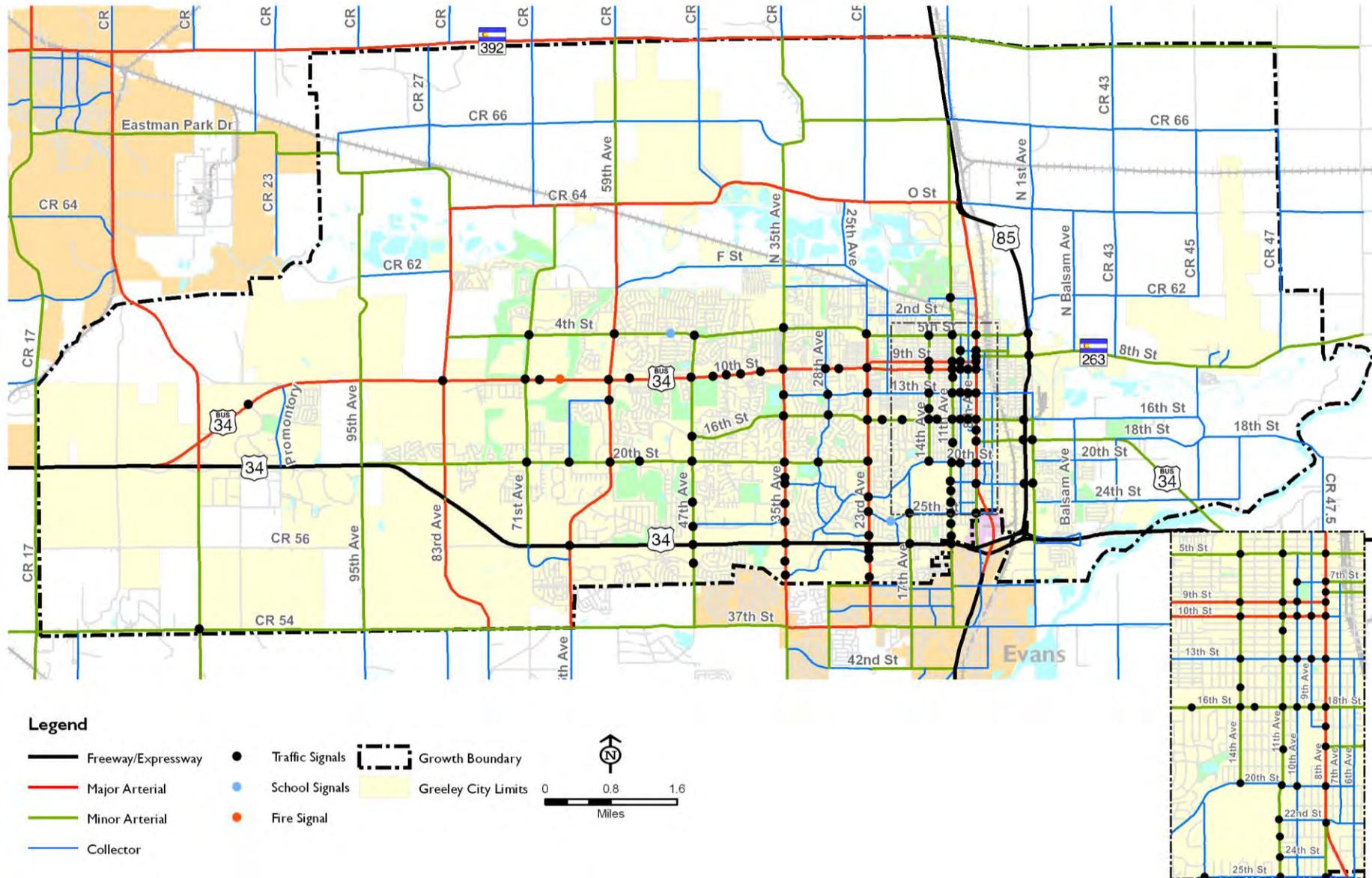
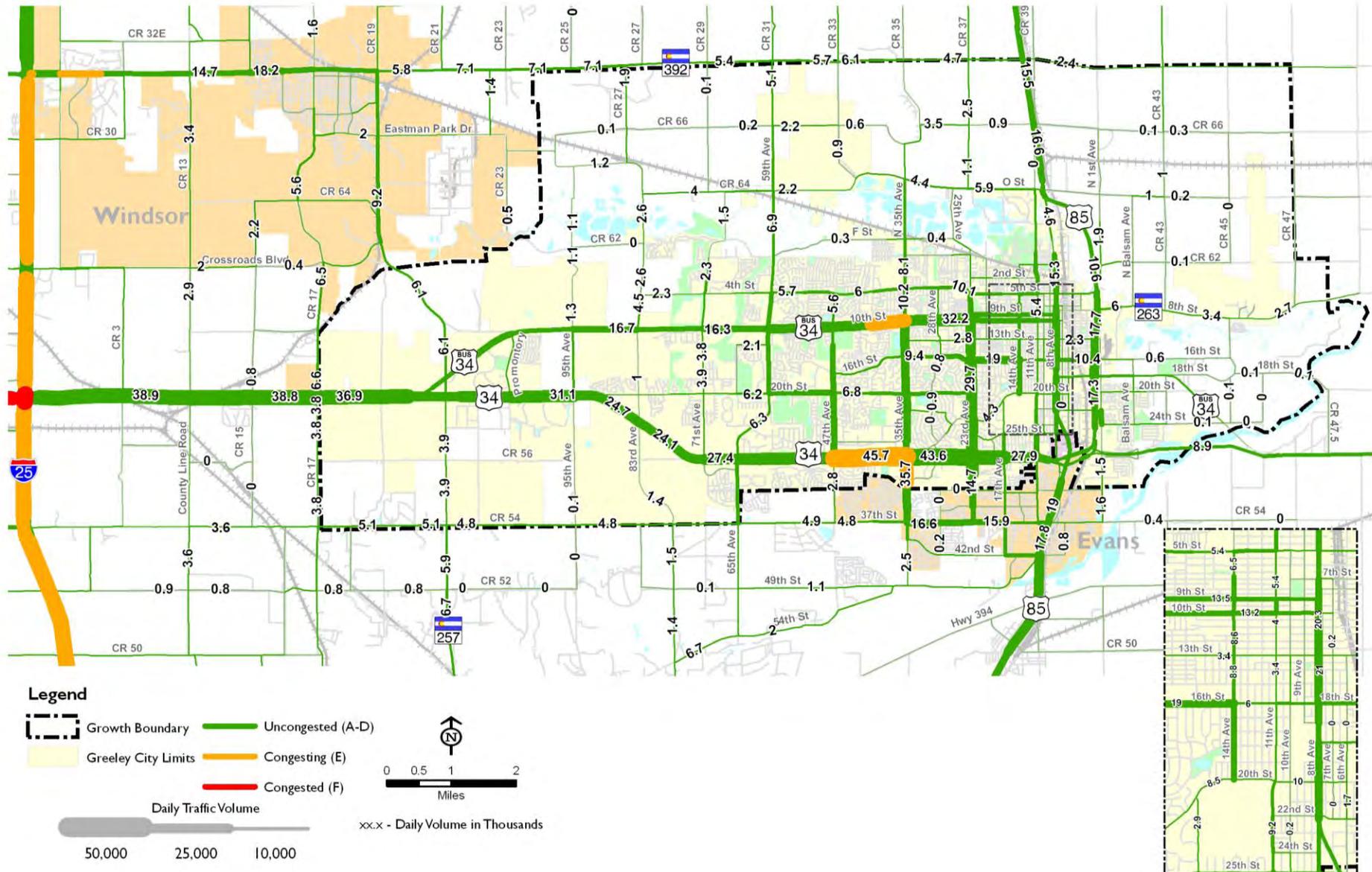


Figure 2-4: 2005 Base Year Daily Traffic Volumes and Congestion Levels



Daily Congestion Levels

One operational measure that can be used on a conceptual level to identify areas of congestion is the volume-to-capacity ratio (v/c). The v/c ratio is used to identify roadway links that, on a daily basis, would experience conditions under, near, or over capacity. The 2005 base year daily congestion levels are presented in Figure 2-4. The congestion levels are depicted via the color of the line with green being uncongested, yellow as congesting, and red as congested. This map indicates that the City experiences very low levels of congestion.

This planning level measure does not take into account delay at signalized intersections and is only based upon daily traffic, with no regard to peak-hour spikes in traffic. In many cases, higher v/c ratios can be experienced with little delay if signal timing is favorable.

AM and PM Peak-Hour Intersection Level of Service Analysis

While v/c ratios can be used as a general tool to identify street links with congestion, typically, traffic flow is qualitatively measured by Level of Service (LOS). LOS is an assessment of the traffic flow characteristics with letter designations ranging from LOS A (essentially uninterrupted flow) to LOS F (a breakdown of traffic flow with excessive delay). The LOS values shown in Figure 2-5 are for the highest congestion AM and PM peak-hours at each intersection. Each value of LOS is based upon the average delay experienced by the motorist. This analysis provides a much more detailed assessment of traffic operations at the intersections, which are the “choke points” of the City’s street segments.

The AM and PM peak-hour intersection levels of service and congestion are presented in Figure 2-5. In general, the AM and PM level of service for most intersections within the City reflect the same good operating conditions as depicted in the daily volume-to-capacity ratio methodology for the daily arterial volumes.

What is the Definition of Traffic Congestion?

Planners and engineers use a measurement called Level of Service (LOS) to gauge the adequacy of transportation facilities. Similar to grades in school, LOS is scored using letters from A to F, where A represents the best conditions and F represents failure. Level of service scores can be grouped into three color-coded categories as defined below:

- 

Uncongested (Level of Service A - D): Corridors that generally operate in free-flow conditions, where the driver tends to be able to travel without undue delay except for typical traffic control operations, such as stop signs or traffic signals. During the peak-hour, there might be some delay at a controlled intersection, but generally the driver can get through the intersection within one cycle of the traffic signal.
- 

Congesting (Level of Service E): These corridors are roadways where the driver can generally travel in free-flow conditions during the off-peak-hours, but might experience having to wait more than one cycle at a signalized intersection during the peak-hours or have difficulty changing lanes. Because these corridors are approaching capacity, there can be significant variations in congestion from day to day, fluctuating between acceptable and congested.
- 

Congested (Level of Service F): The congested corridors in Greeley are those roadways where traffic volumes have either reached or exceeded the facility’s theoretical capacity. These facilities experience daily congestion delays where it is not uncommon that a driver might have to wait two or more signal cycles to get through the intersection.

Intersections that have low peak-hour levels of service are along the US 34 Bypass and some intersections along US 34 Business Route, 23rd Avenue, and 35th Avenue.

Roadway Maintenance

The City of Greeley currently maintains 359 miles of public streets, not including State Highways or private streets. This transportation network provides almost all travel within and through the City.

Over the past number of decades, the City of Greeley has been able to provide the transportation capital funds for the construction of new roadways and widening of existing roadways to accommodate the City's growth and expansion, primarily to the west. Whereas these new roadways are in excellent condition when constructed, they require maintenance over time. Maintenance also has to be provided strategically. Based on years of pavement research, a new road will remain in excellent condition for the first 10 to 15 years, but then will require some basic maintenance (Figure 2-6). If that maintenance is not provided around the 15-year mark, the roadway rapidly deteriorates and maintenance can soon cost five times the initial cost if not performed when necessary.

The condition of the roadway pavement quality is an important measurement of the roadway systems. The pavement quality index is a scale from 0 to 100 that rates the quality of the roadway pavement from very poor to very good. Typically, most jurisdictions and state departments of transportation target a good pavement condition.

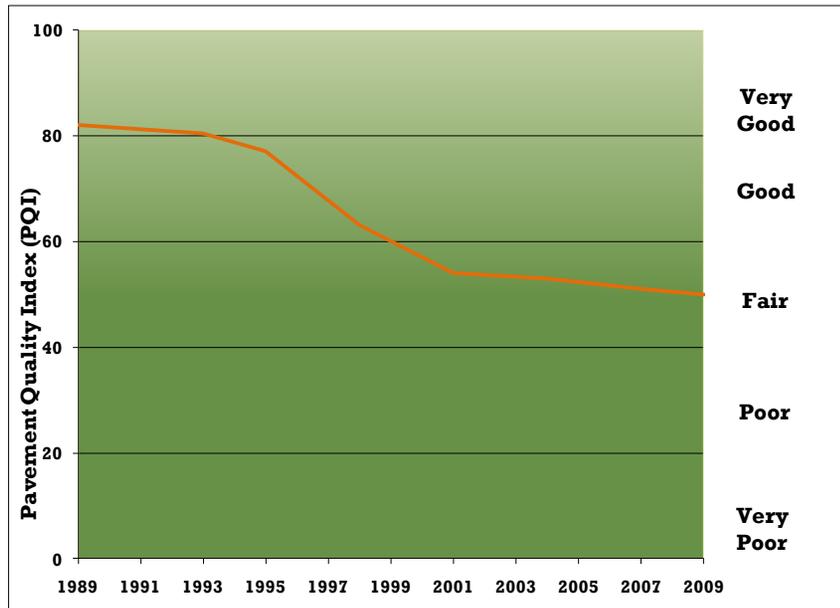
The difference between a very good roadway and a fair roadway might not appear that different to the user, but the cost difference to repair that roadway is significant.

The history of the City of Greeley's pavement quality is presented in Figure 2-7. Greeley's maintenance funding has not been at the level necessary to keep up with basic maintenance for an aging roadway network. This has resulted into a rapidly deteriorating roadway for which repairs will cost much more today than they would have had they been made when warranted. Compounding the problem is that even the new roads are also getting older and require maintenance.

Figure 2-6: Pavement Quality by Year and Cost of Maintenance



Figure 2-7: City of Greeley Pavement Quality Index



Roadway maintenance has become a crisis in the City of Greeley, and increasing the maintenance budget will be a significant challenge.

Based on current engineering estimates, the annual City of Greeley maintenance need is approximately \$12 million, whereas the current maintenance budget is \$3 million. The City of Greeley is getting farther and farther behind with an annual shortfall of \$9 million per year. Without additional maintenance, the City of Greeley’s streets will further deteriorate from a very good condition in the late 1980’s and early 1990’s to a poor condition within the next few years.



Streets



Bike & Pedestrian Paths



Sidewalks

Existing Transit Service



Transit service within the City of Greeley is provided by Greeley-Evans Transit (GET) operated by the City of Greeley. Transit service includes an integrated fixed-route service and a general public dial-a-ride and paratransit service network within the urbanized area. Service in Evans is operated through an intergovernmental agreement. The City of Greeley also has an intergovernmental agreement with the University of Northern Colorado to operate transit service on UNC’s campus.

A map of the fixed-route transit service is illustrated in Figure 2-8. There are currently seven routes, which operate on a pulse-type service, where all transit routes travel to and from the downtown transfer center and the transfer stop at the Greeley Mall. Six of the routes operate year round, while the UNC Bear Gold (Day) and Bear Blue (Night) route only operates while the University is in session during the fall and spring semesters.



The transit service coverage is best in the easterly and older portions of the City. The existing bus service also provides reasonably good service to the center part of the City, whereas transit service to the outlying area is not very good. GET provides general public-demand-responsive service in the evenings, Monday through Saturday, augmenting the fixed-route service, and on Sundays from 7:45 AM to 1:45 PM.

In addition to fixed-route service, paratransit service is provided within ¾ mile of fixed-route service.

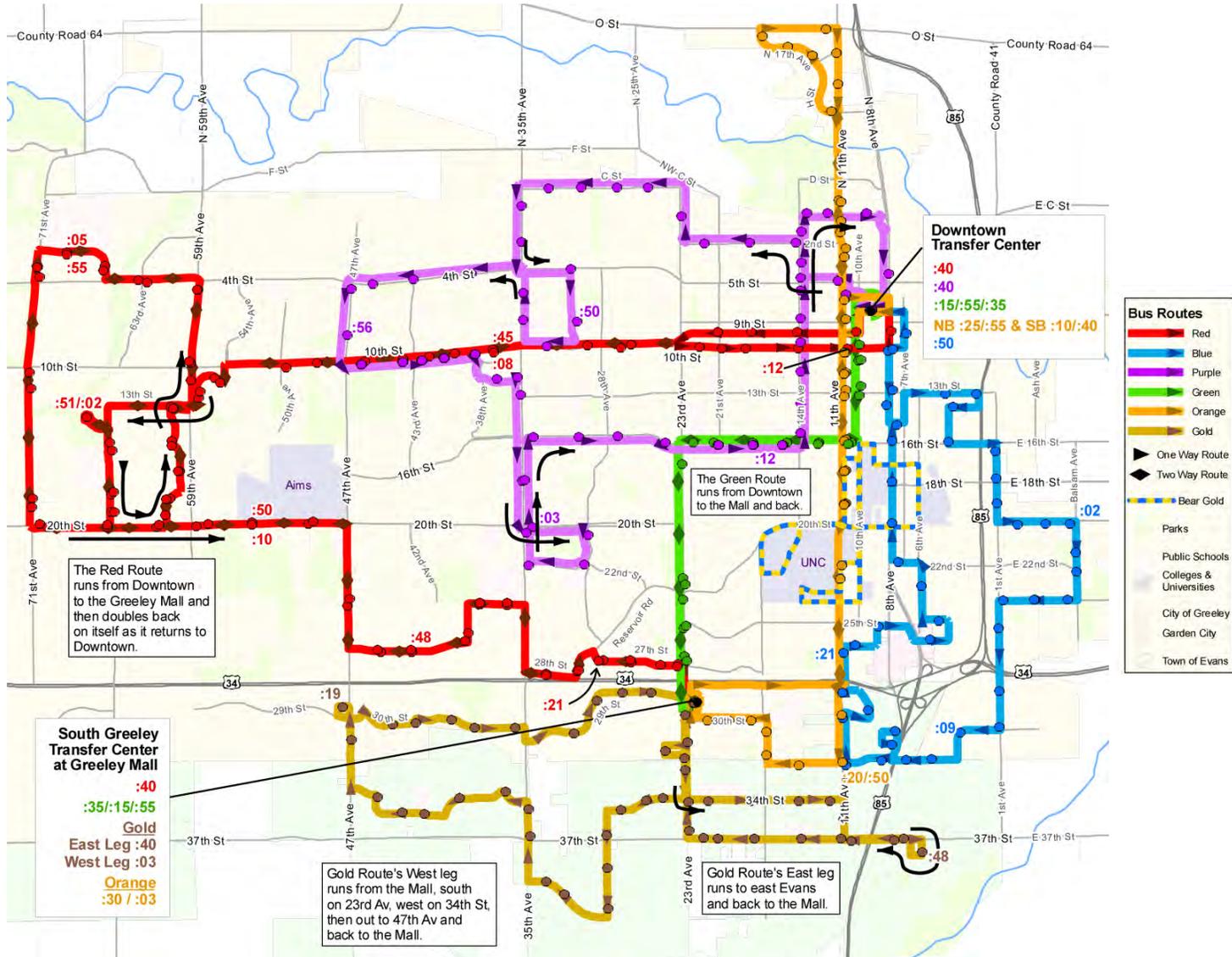
GET’s capital equipment and facilities include a fleet of 25 revenue vehicles, maintenance and operations facility, and a variety of shelters and passenger transfer facilities. The maintenance and operations facility was built in 1982 and it has received regular maintenance and rehabilitation, so it is in good condition. While the costs of ongoing maintenance may increase due to the age of the facility, it can continue to serve the system well for many more years.

Greeley-Evans Transit provides good quality service in key corridors and areas of the community, and the system is well-managed, providing cost-effective use of its resources. As the area has grown, it has been difficult to stretch the system to provide effective services to new areas. This has resulted in stretching the distances that routes cover, so 60-minute frequencies are provided on routes where 30-minute services were once provided.

The transit system continues to focus on serving the mobility needs of individuals who do not have access to automobile transportation. Recently, there have been more individuals who combine the transit and bicycle modes. The linking of neighborhoods to transit services through effective pedestrian and bicycle networks will likely be more important in the future.



Figure 2-8: Fixed-route Transit Service



The transit system received FTA funding for capital and operations, which has been supplemented by a local match from the City of Greeley. Because the City's population is growing, it may exceed the threshold for small urban area options funding. If the level of federal operating funding changes, it will be necessary to determine the level of local resources the community is willing to use for the provision of transit services.



Resources for transit services are limited, yet it is critical that the services that are provided form a viable network that will result in high levels of ridership. As a general rule, the most effective use of transit funding will be to provide an effective and viable network in a constrained area. The Greeley-Evans urbanized area has activity centers that are quite spread out, so this may mean focusing any new resources in the current service area or focusing on key corridors with limited penetration into neighborhoods.

Bicycle



The City of Greeley's existing bicycle network is presented in Figure 2-9. The bicycle network includes recreational trails, shared-use paths, bike lanes, and bike routes. These facilities are defined as follows.

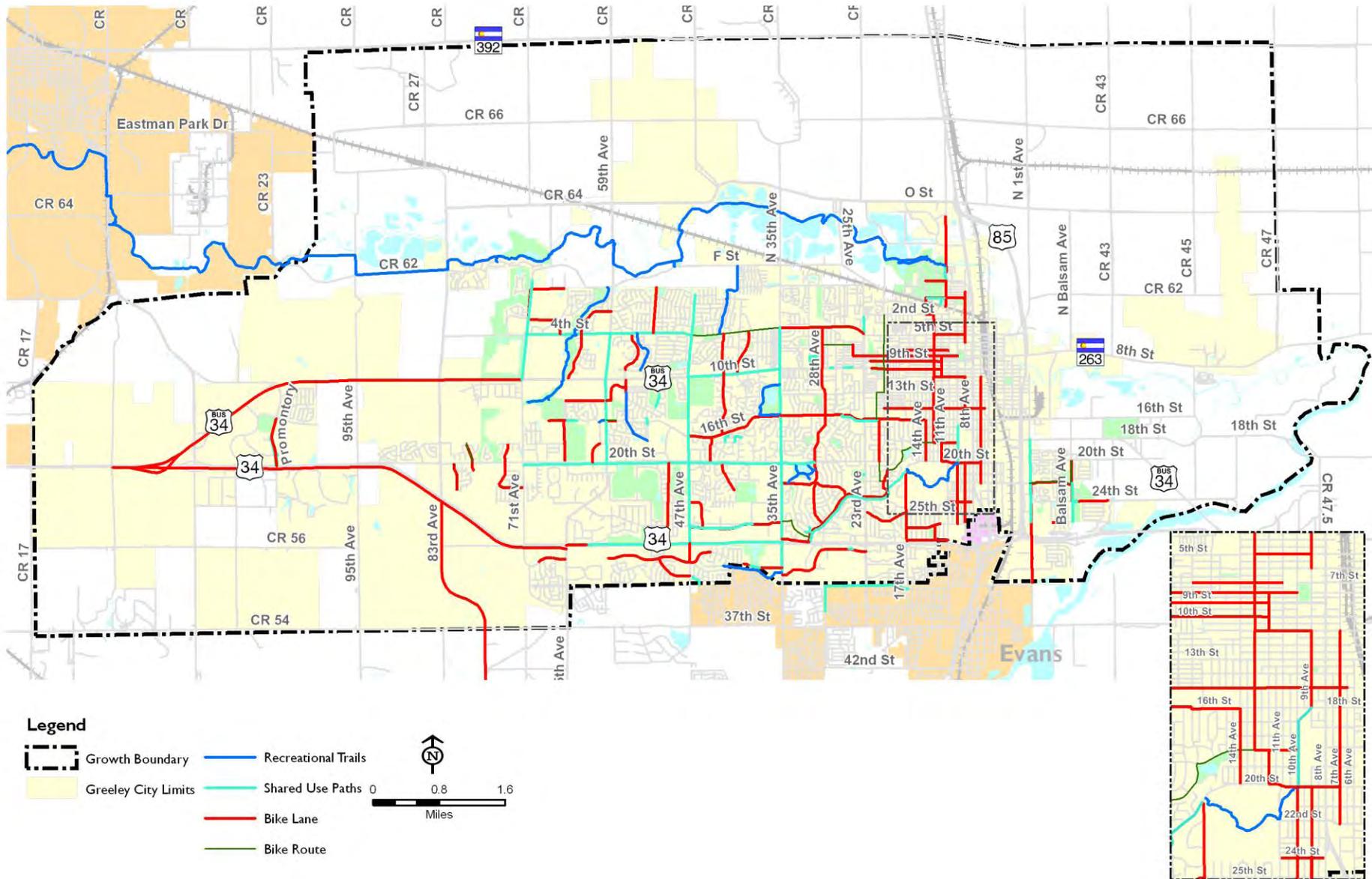
- **Recreational Trail:** These are facilities primarily used for recreational purposes. They consist of a 10-foot to 12-foot paved trail for both pedestrians and bicyclists. They are located off-street and typically follow a recreational or open space easement, such as along a river or between development areas.

- **Shared-use Path:** Shared-use paths are separated from a street and designed for two-way travel. Shared-use paths are adjacent to roadways and, typically, within the dedicated street right-of-way. These paths can include other non-motorized traffic, such as in-line skaters, wheelchair users, pedestrians, runners, etc. Shared-use paths are typically 8-10 feet in width and can be thought of as a complementary system of off-road urban transportation routes for cyclists. These shared-use paths are also part of the City of Greeley major and minor arterial street standards.
- **Bicycle Lane:** Bicycle lanes are designated with pavement markings, as well as signs along streets. The pavement markings delineate the right-of-way of both motorists and cyclists. A typical bicycle lane width should be 6 feet. Delineation of bicycle lanes should be carried through street intersections. The maintenance of these routes for bicycle travel is critical so that cyclists are able to stay in their lane.
- **Bike Routes:** Bike routes are designated roadways that have lower traffic volumes and travel speeds where the bicycle and the automobile share the same travel lanes. Bike routes are accompanied by bicycle route signs or sharrow pavement markings that provide continuity to other bicycle facilities or designate preferred routes.

In review of Figure 2-9, it is evident that there is not a system of improvements where one can easily find a way to bicycle from one part of the City to another. In spite of the fact that there is not a detailed system of trails, paths, lanes, and routes, traveling by bicycle is somewhat provided through the grid of neighborhood streets, which allows the bicyclists to travel along lower volume streets.

In review of the bicycle network, it is also important to consider the types of bicycle travel, the experience of the bicycle rider, and the type of facility they may use.

Figure 2-9: Existing Bicycle Network



In general, there are three types of bicycle travel: commuting, adult recreation, and children. The design of bikeways differs considerably for each of these purposes. Commuter bicyclists are typically advanced riders and are generally using their bicycles as they would a motor vehicle. They want direct access to destinations with minimal detour or delay. They are typically comfortable riding with motor vehicle traffic; however, they need sufficient operating space on the travel way or shoulder to eliminate the need for either themselves or a passing motor vehicle to shift position. Commuting bicyclists often want to ride the most direct route from their origin to their destination. Normally, extensive development along such routes limits the construction of detached bicycle/multi-purpose paths. However, prevalence of heavy traffic along such routes is only a minor hindrance to commuting bicyclists.

Recreational adult riders may also be using their bicycles for transportation purposes (e.g., to get to the store or to visit friends), but prefer to avoid roads with fast and busy motor vehicle traffic unless there is ample roadway width to allow easy overtaking by faster motor vehicles. Thus, recreational riders are comfortable riding on recreational trails, shared-use paths, and neighborhood streets. They may also consider bicycle lanes or wide shoulder lanes on busier streets. Recreational riders may also be using their bicycles for pleasure and exercise without a specific destination in mind. Such riders may prefer recreational trails along open spaces instead of traveling adjacent to or with motor vehicle traffic.

Children, riding on their own or with their parents, may not travel as fast as their adult counterparts but still require access to key destinations in their community, such as schools, convenience stores, and recreational facilities. Residential streets with low motor vehicle speeds, linked with recreational trails or shared-use paths may serve them well.

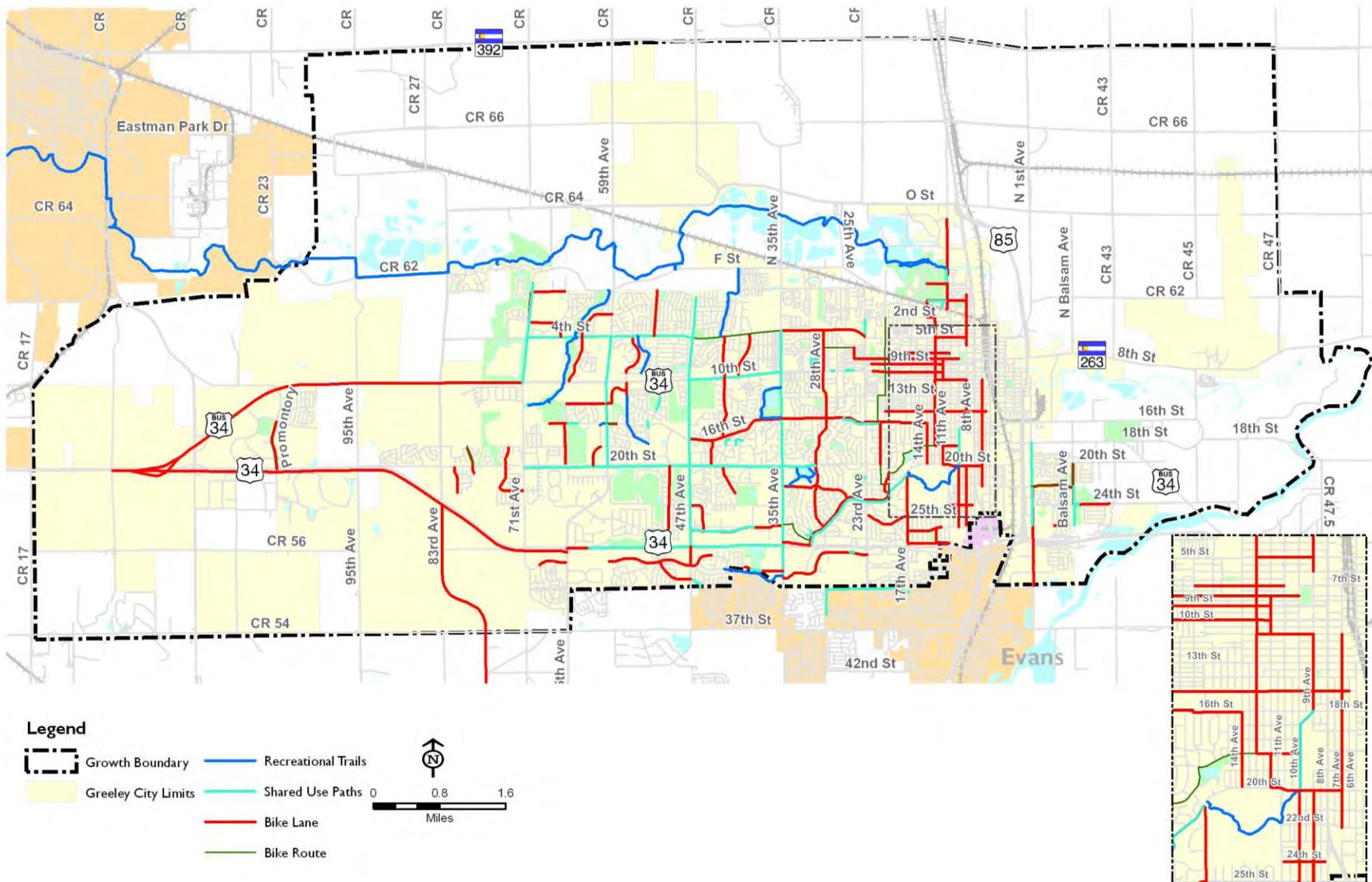


Pedestrian

The pedestrian system includes the sidewalks along our streets, recreational trails, and shared-use paths. This system also includes street crossings. A pedestrian system should provide for convenient direct and continuous sidewalks with safe street crossings. It also should have some basic visual interest and amenities. The ultimate pedestrian system is best described as a grid system that provides easy connections via direct connections.

In general, the City of Greeley has good sidewalk coverage. There are some urban areas within the City without sidewalks, as presented in Figure 2-10. Some of these areas were once in the County, later annexed, and were not built to City standards. There will be future redevelopment opportunities when these areas are further developed.

Figure 2-10: Urban Areas Without Sidewalks



The City of Greeley's pedestrian system ranges from very good in the downtown area, to moderate in the outlying areas. As illustrated in Figure 2-11, the downtown area has a very strong grid system with short blocks and sidewalks on all facilities. The pedestrian must cross a number of lanes even where the speeds of the roadways are low, all of which verify the need to improve the pedestrian environment.

The City of Greeley's pedestrian network is very good in the older residential areas where sidewalks were required with development. In the newer residential areas, there are some areas where curvilinear roads do not provide for direct connections. Also in some of these areas, the ability to cross a major high-volume and high-speed arterial is difficult. Safe pedestrian crossings on arterials are important, given that every transit trip begins and ends as a pedestrian trip.

Portions of the intersections in the older areas of Greeley area do not have handicap curb ramps. This is also true of many of the downtown intersections where there is higher pedestrian traffic.

Rail System

Rail transportation in the Greeley area primarily serves the purpose of moving freight. The Union Pacific Railroad (UP) is the one Class One Railroad serving the Greeley area. A Class One railroad is a railroad with gross operating revenues of \$50 million or more annually from railroad operations. The Great Western line extends from Greeley to Fort Collins, where it joins with the Burlington Northern line that extends from Montana to Texas. The UP line runs along the US 85 Corridor from Denver to Cheyenne, Wyoming. Passenger service through Greeley is no longer available. These rail corridors are presented in Figure 2-12.

The City of Greeley currently has 22 railroad/highway at-grade crossings which are also presented in Figure 2-12. The number of crossings bisecting east-west streets and those bisecting north-south streets is nearly equal. East-west traffic volumes across the crossings tend to be higher than those in the north-south direction. All active

crossings are equipped with advance warning signs and/or devices of some sort. Thirteen of these crossings are equipped with flashing lights in addition to the cross-buck warning signs. Of these, 11 are equipped with control gates, and seven have overhead mast arm flashing lights.

The City and Downtown Development Authority (DDA) are investigating the possibility of a quiet zone in the downtown area to address train horns and high decibel levels.

Aviation System

The Greeley-Weld County Airport is a general aviation airport. The airport currently serves approximately 145,000 annual operations and has 224 based aircraft. It is located three miles east of the US 85 Bypass, off SH 263 (8th Street), at an elevation of 4,657 feet above sea level. Although there is no scheduled passenger service, it is the third busiest general aviation airport in the State of Colorado. A variety of aviation services ranging from corporate aircraft services, to crop dusters, air med/air ambulance, to flight training are offered at this airport. It can accommodate various types of aircraft ranging from corporate jets to MD-80 s. There are currently approximately 115 people employed at the airport. The airport includes a 10,000 foot runway and a 5,800 foot runway.

Figure 2-11: Pedestrian Network Examples



Downtown: Strong grid system with short blocks & sidewalks



Older Neighborhoods: Strong grid system, short blocks & sidewalks

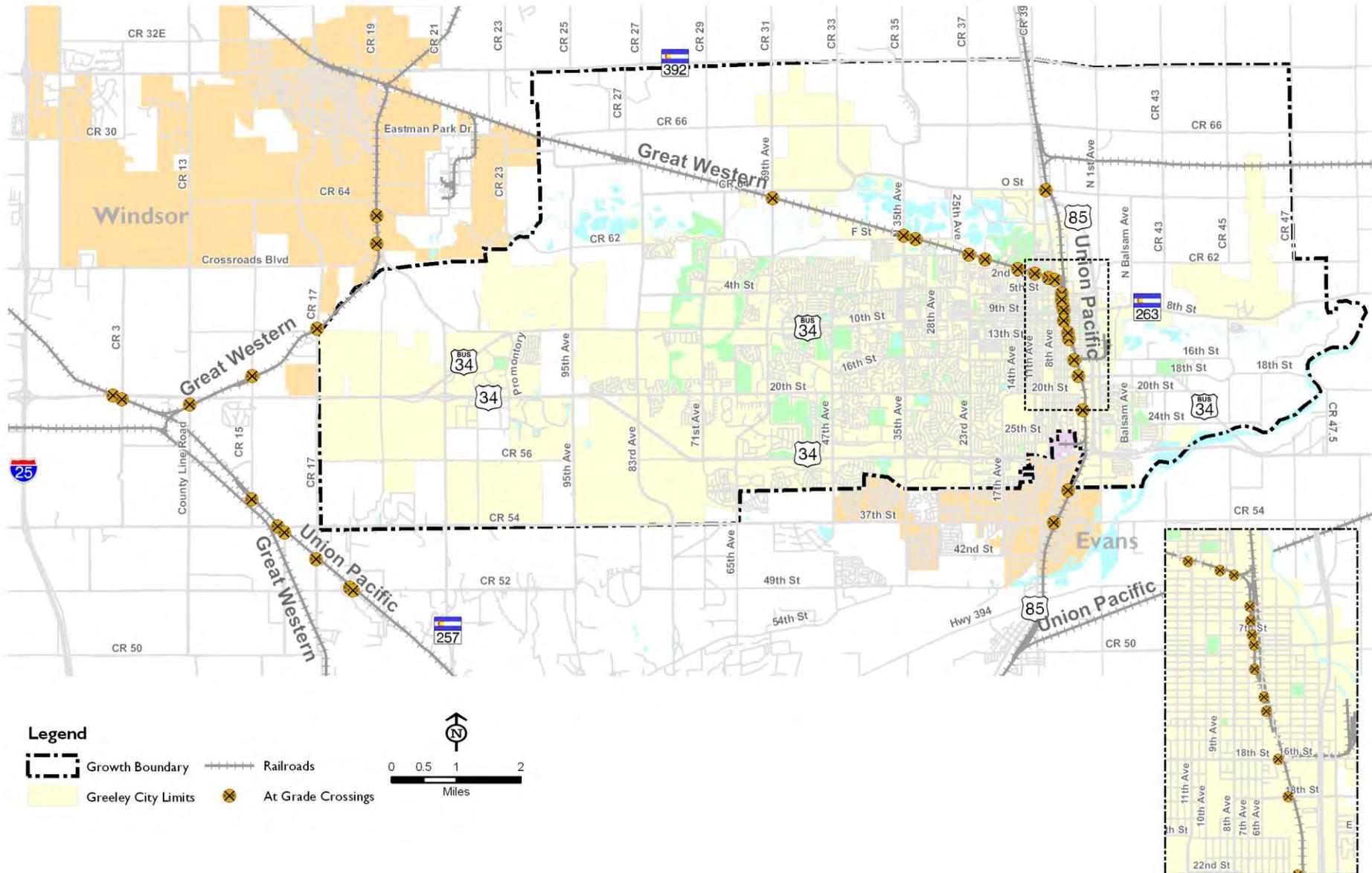


Newer Neighborhoods: Curvilinear streets, reduced direct connections, longer blocks with sidewalks



Difficult street crossing of some major arterials

Figure 2-12: Rail Corridors



Chapter Contents

- Growth in Households and Employment
- Projected Travel Demand Patterns
- Forecast 2035 Daily Traffic and Congestion

Understanding future growth and where growth will occur will affect travel patterns and the City’s future transportation needs. Based on the Colorado Department of Local Affairs (DOLA), the North Front Range Metropolitan Planning Organization, and the City of Greeley’s 2060 Comprehensive

Plan, the City of Greeley’s households will nearly double by 2035 and employment will increase by 75%. This population and employment growth will correlate to more trips, traffic, and congestion.

The City of Greeley’s recently adopted 2060 Comprehensive Plan provides a guideline for future land use development patterns, which are forecast to occur primarily in the western portions of the City. New development will require new roadways to serve this growth. The 2060 Comprehensive Plan also proposes mixed-use activity centers and an integrated land use and multi-modal transportation system.

The following chapter presents the forecasts and estimates for travel demand used to develop the 2035 multi-modal transportation plan elements.

Growth in Households and Employment

The estimate of forecast growth is based on a number of sources including the Colorado Department of Local Affairs (DOLA), the North Front Range (NFR) Metropolitan Planning Organization (MPO) and the City of Greeley.

DOLA provides the base household and employment forecasts for all counties and regions within the State of Colorado. These forecasts are provided by five year increments and are projected through 2035. The DOLA forecasts also provide the control totals for the NFR MPO travel model which includes Greeley, Fort Collins, Loveland, Windsor, Evans, Milliken, Johnstown, Timnath, and portions of unincorporated Weld and

Larimer Counties. The NFR MPO distributes these household and population forecasts based on the long-range plans of each jurisdiction.

The NFR travel demand model is used to project future travel volumes in the Greeley area. The model relies on two primary elements of socio-economic data: households and employment. The socio-economic forecasts have been refined per the City of Greeley 2060 Comprehensive Plan.

A summary of the base year 2005 and projected 2035 residential and employment data within the City of Greeley’s growth boundary is presented in Table 3-1. As shown in this table, households will increase by approximately 31,000 to a total of 64,000 households by 2035. Employment will increase by 38,000 jobs to 88,000.

Table 3-1: Existing and Forecast Households and Employment - City of Greeley’s Growth Boundary Area

	2005	2035	Difference	Percent Increase
Households	32,700	64,100	31,400	96%
Population	84,400	163,100	78,700	93%
Retail Employment	9,900	12,700	2,800	28%
Service Employment	29,800	60,200	30,400	102%
Basic Employment	10,600	15,000	4,400	42%
Total Employment	50,200	87,800	37,600	75%

The distribution of household growth is presented in Figure 3-1. Employment growth is presented in Figure 3-2.

As shown in these figures, the highest concentration of household growth is expected to occur in the western section of Greeley, and some areas extending beyond the existing City limits. The highest concentration of employment growth is expected to occur primarily along the US 34 corridor and approaching the I-25 corridor.

It should be noted that most of the western sections of land within the Greeley 2060 Comprehensive Plan boundary are in the Greeley City Limits, but remain undeveloped. Properties west of the City of Greeley are within the Town of Windsor Limits and unincorporated land within the Town of Windsor growth boundary.

Projected Travel Demand Patterns

The future travel demand patterns in the Greeley area, and the North Front Range region, as a whole, are primarily a function of the households and employment opportunities in the area. The household and employment data outlined in the preceding section were used as input in the North Front Range travel demand model. The model was then used to identify deficiencies in the roadway network and to evaluate the effectiveness of alternative improvements.

The NFR travel demand model was updated and used to prepare the NFR MPO 2035 Long Range Transportation Plan. The model area extends from SH 66 to the south, to Larimer County Road 88 to the north, and from east of Greeley to west of Fort Collins. For the purpose of estimating the future travel demands in the Greeley area, the Existing + Committed (E+C) transportation network model was used as a base network. This network includes the existing roadway system plus any projects which are currently committed in the Transportation Improvement Plan (TIP).

With forecast regional growth, the percent of Greeley residents who work outside the City will increase. This will result in longer trip lengths and travel time.

Assessment of Travel Behavior - Work Trips	2005	2035
Percent of Greeley Workforce Who Travel Outside Greeley	18%	30%
Average Work Trip Length - Miles	5.3	6.5
Average Work Trip Time - Minutes	8.6	16.9

Forecast 2035 Daily Traffic and Congestion

Based on the City of Greeley growth area 2035 households and employment forecasts, and the NFR MPO 2035 travel demand model, a 2035 daily traffic forecasts and congestion map was prepared, as presented in Figure 3-3.

As presented, there are severe congestion levels forecast for the City’s major east-west corridors of the US Hwy 34 Bypass and Business Route. Given the magnitude of growth, coupled with the fact that these are the only two continuous east-west corridors, the degree of congestion is not surprising. Both of these facilities are four lanes and do not provide the right-of-way or frontage to allow for widening to six lanes. Therefore, any relief to the US Hwy 34 Bypass and Business Route will require an additional parallel corridor for east-west travel.

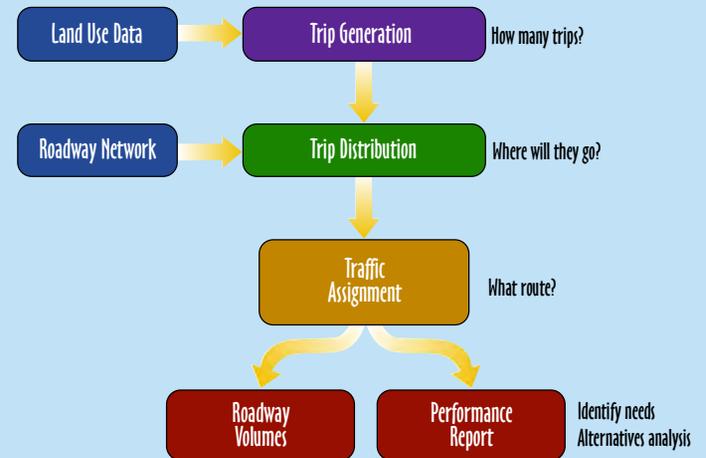
There are additional facilities in the western portion of the City which will also result in future congestion, including SH 257, 95th Avenue, and 59th Avenue south of the US 34 Bypass. These roadways in the western portion of Greeley are still developing and would likely be improved to acceptable standards as part of future development improvements within the area.

Because of the strong grid system, with lower expected growth rates in the City of Greeley’s downtown area and the older portions of the City, the existing roadway system would be able to accommodate future growth.

Forecasting Traffic North Front Range MPO Travel Demand Model

The 2035 traffic forecasts are based on the North Front Range MPO travel demand model. The model process uses estimates of household and employment data and the existing roadway network as input assumptions. Household and employment data are estimated by small forecast areas called Traffic Analysis Zones (TAZ). The model utilizes three basic steps:

1. **Trip Generation:** Based on existing and forecast socio-economic data including the number of households and employment, the model estimates trips by trip type, such as work trips, shopping trips, or service trips. By comparing base year trip generation to forecast 2035 trip generation, one can see the estimated growth in trip activity within the area.
2. **Trip Distribution:** The trip distribution process examines the relationship between where trips are produced or generated in relationship to where they are attracted or the destination end of the trip. As an example, a Home-Based Work Trip begins at the residence and travels to the place of work. This process of distributing trips is conducted for each trip type and for each trip generated throughout the modeling area.
3. **Trip Assignment:** This is the process where the trip distribution patterns are assigned to various routes between where the trip originates and its destination. The modeling software recognizes the travel speeds of the roadway network to identify the shortest distance and time paths. The model also recognizes that, as the roadways fill up, congestion might occur making alternate routes more attractive.



The North Front Range MPO regional travel model forecasts daily and peak-hour traffic. The model's accuracy is developed through a sophisticated model calibration process where estimated existing trips, based on the area's current population and employment characteristics and the area's roadway network, are compared to actual traffic counts.

The travel model is useful as a tool throughout the transportation planning process. It is used in needs assessment to identify future deficiencies. The transportation alternatives were tested using the model to guide the development of the preferred transportation vision for the City.

Figure 3-1: Distribution of Household Growth

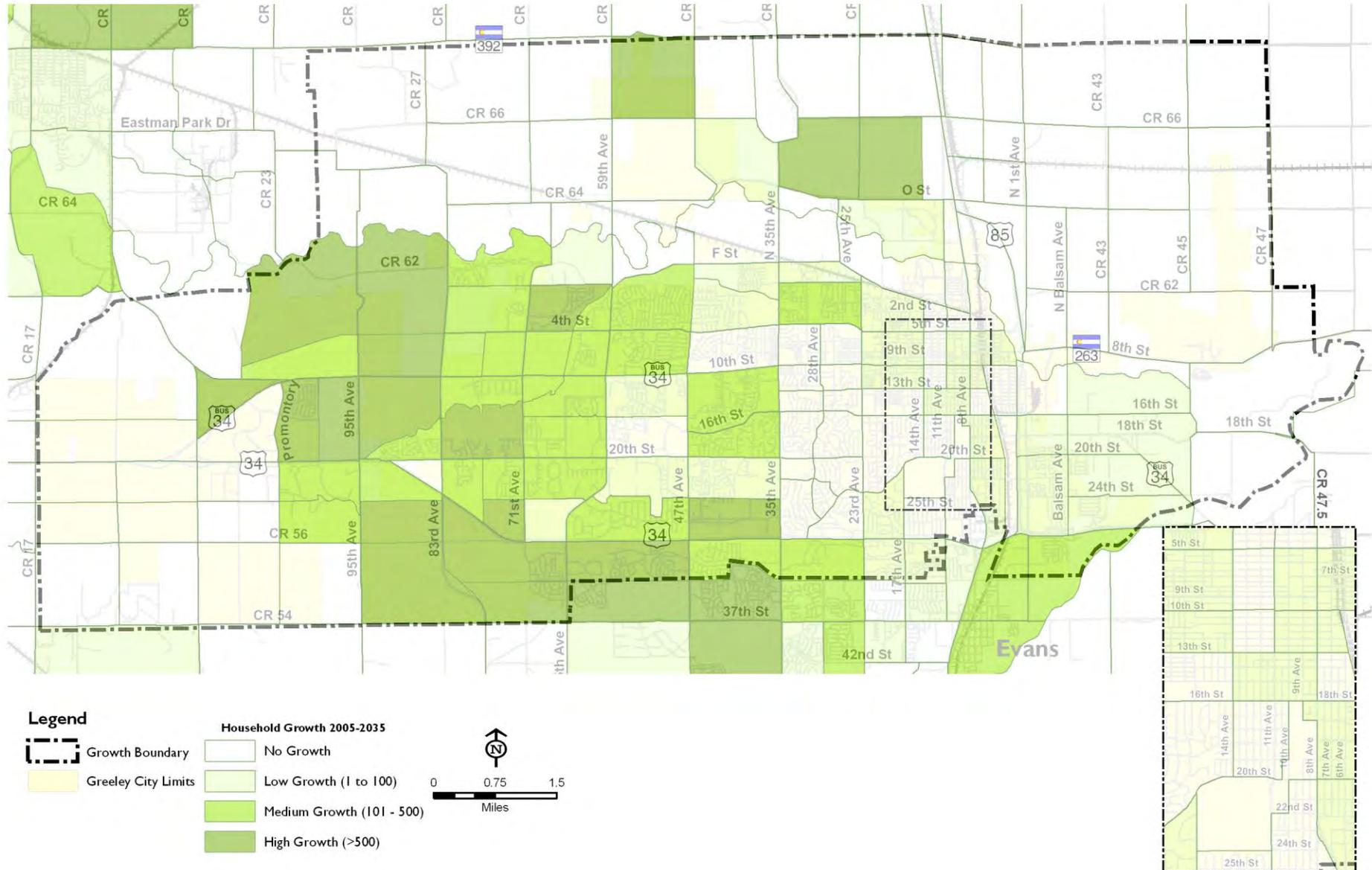


Figure 3-2: Employment Growth

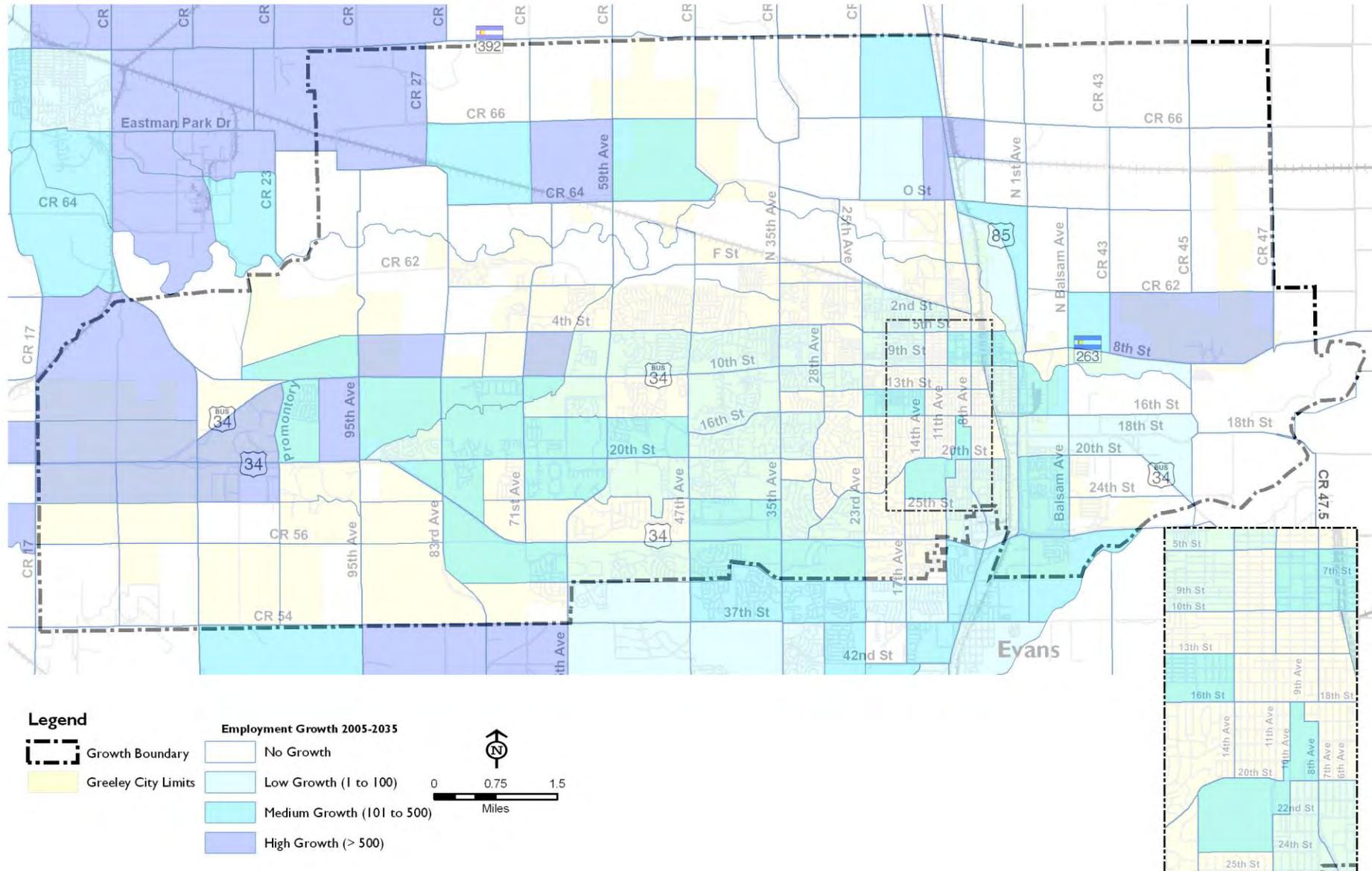
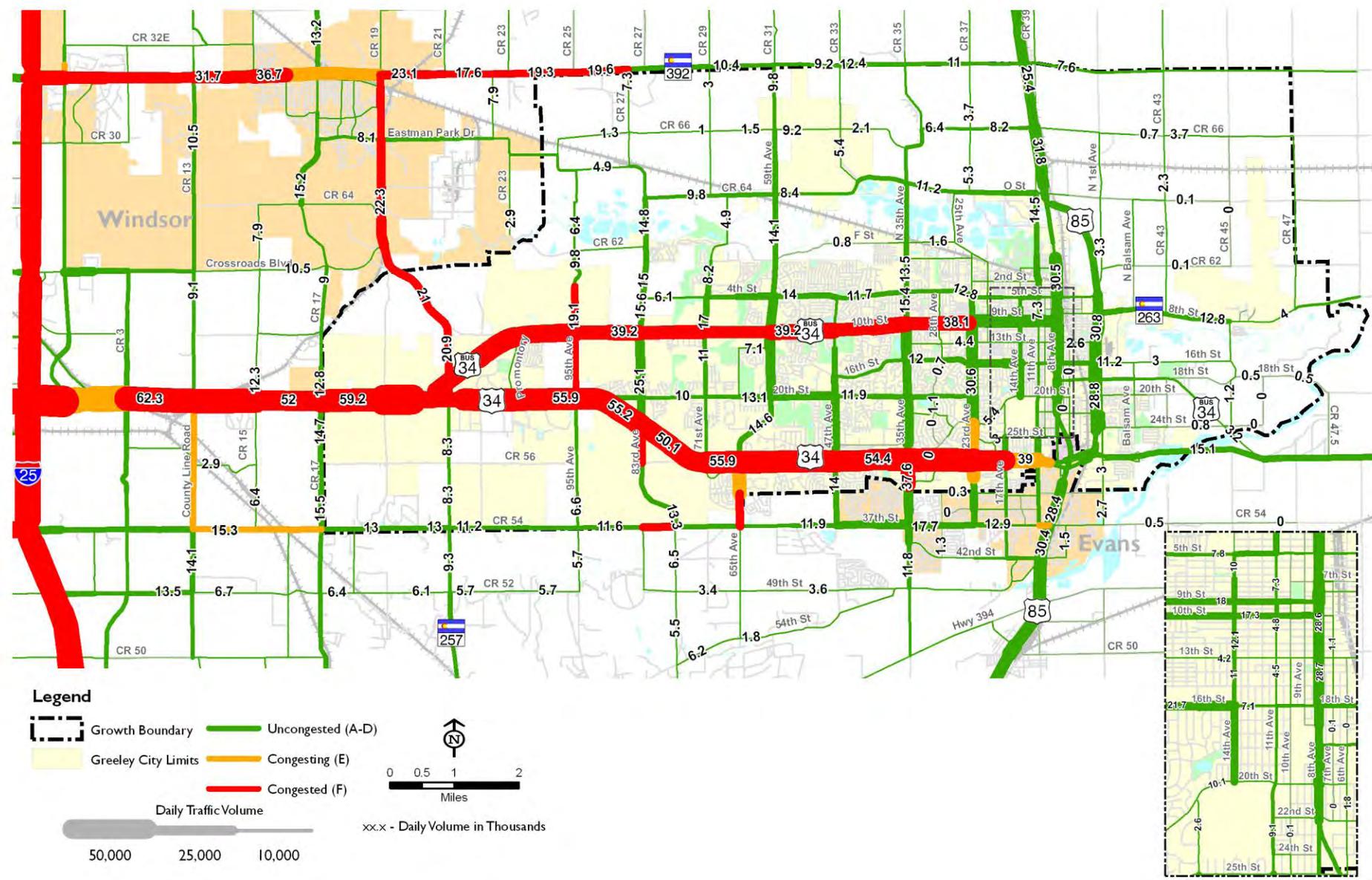


Figure 3-3: 2035 Daily Traffic Forecasts and Congestion Map



Chapter Contents

- Integrating Land Use and Transportation
- Maintenance
- Master Streets Plan
- Transit Vision Plan
- Bicycle Vision Plan
- Pedestrian Vision Plan
- Hazardous Material Routes
- Traffic Signal Design and Operation
- Intelligent Transportation Systems (ITS)
- Neighborhood Traffic Calming Program (NTCP)

The City of Greeley 2035 Transportation Plan is structured around a number of key elements that directly relate to the goals listed in the Introduction of this plan. The plan promotes integration of the City of Greeley's 2060 Comprehensive Plan with the realistic need to plan for better vehicular mobility in the high-growth areas of Greeley and increased opportunities for alternate modes of transportation. The following are salient features of the plan:

- A streets plan that provides relief to east/west corridors and the continuation of the grid system for developing areas;
- Logical expansion of the existing transit system to serve new development areas and increase transit ridership;
- The development of a comprehensive bicycle network that serves all population groups;
- The continuation of a pedestrian system for all new development; and
- Providing pedestrian connections in key areas where pedestrian systems are not currently provided.

This plan contains an outline of specific improvements to each transportation mode network, design, and implementation criteria on that would be required of new development, as well as recommendations of actions that provide guidance in the planning process.

Integrating Land Use and Transportation

A major goal of the recently completed City of Greeley's 2060 Comprehensive Plan is for the integration of land use and transportation. This integration introduces two major concepts: mixed-use activity centers and multi-modal corridors. The 2060 Comprehensive Plan has identified a number of mixed-use centers located primarily at the intersection of major arterials.

Mixed-Use Activity Centers

The objective of compact mixed-use activity centers is to reduce VMT and promote walking and other alternative modes of transportation. These centers bring residents closer to employers, schools, stores, post offices, and other services, thereby increasing opportunities to make more trips by bike and on foot.

The availability and quality of public transit and other transportation options can influence the decisions of employers, residents, and developers. Having a variety of safe and efficient ways to travel can attract residents, employers, and visitors. It can also encourage people to choose alternatives to driving alone as comfort increases and travel time declines.

Each activity center may not be the same; however, common elements include the presence of mixed-use retail, office, and residential land uses, connected by complete streets, transit-friendly design features, and accessibility to alternative modes of transportation.

In general, these developments have a conveniently-located commercial area containing a mix of office, retail, and service uses. The core commercial district should be centrally located to support transit usage. The size and intensity of the center will vary to fit the needs and preferences of the neighborhood it supports.

Multi-Modal Corridors

Multi-modal travel efficiency can be increased based on integrated infill or redeveloped land uses along these corridors. In the future, these corridors will facilitate linking different modes together (i.e., bikes on buses or being able to park once and walk to multiple destinations), giving people workable choices to travel.

The starting and ending points of a multi-modal corridor are the mixed-use activity centers. Between these centers, a significant amount of travel demand is expected.

Maintenance

Maintenance is often not included in a transportation vision plan. It is expected that, as roadways, sidewalks, and bicycle facilities are added to the system, they are maintained. Because the City of Greeley's street system is rapidly deteriorating due to lack of funding, the Greeley Transportation Vision Plan must state that maintenance of the existing transportation system is the highest priority and should precede any construction of new roads or other transportation infrastructure.

Lack of investing in maintenance increases the cost of future maintenance which will take years to recover. Based on public input, the sentiment is that maintenance is critical to our transportation system and quality-of-life, and it should be a priority over other transportation investments.

Master Streets Plan

The Master Streets Plan provides the blueprint for future street improvements within the City of Greeley. The streets network forms the backbone of the entire multi-modal transportation system in the City of Greeley. In addition to automobiles, the street system accommodates transit and commercial vehicles, bicycles, and pedestrians. These streets are an important part of the local economy and provide mobility for local and regional connections.

Historically, the automobile and roadway construction have dominated transportation investments in the City of Greeley. For the foreseeable future, the automobile will likely continue to be the primary mode of transportation, but as these streets are improved to accommodate new development, they will include bike lanes and shared-use paths. The streets network must continue to be maintained and improved to keep pace with growth.

Streets Plan Hierarchy

The Master Streets Plan is based on a hierarchy of streets. These streets include Freeways/Expressways, Major Arterials, Minor Arterials, Collectors, and Local Streets. As presented in Table 4-1, the higher the level of roadway, the higher the volume of regional and sub-regional traffic and the lower the emphasis on access.

Master Streets Plan Development Process

The Master Streets Plan is a comprehensive roadway plan, which consists of recommended multi-modal roadways which accommodate all travel modes: auto, transit, bicycle, and pedestrian. The Greeley Master Streets Plan has been developed based on technical travel demand model analysis and on input and review by City staff, adjacent jurisdictions, and the Citizens Transportation Advisory Board.

The Master Streets Plan development process began with a review of the previous 2020 Master Street Plan, coupled with review of other roadway plans developed by the NFR MPO, Weld County, the Town of Windsor, and the City of Evans.

An initial travel demand model run was conducted based on the 2035 household and employment forecasts estimated from the City of Greeley 2060 Comprehensive Plan and the existing roadway network to determine what areas within the City resulted in good levels of service and which areas would experience congestion and require additional roadway improvements.

Table 4-1: Functional Classification Criteria Characteristics

Functional Classification					
Characteristics	Freeways/ Expressway	Major Arterials	Minor Arterials	Collectors	Local Streets
Function	Mobility Only	Mobility Primary Accessibility Limited	Mobility Primary Accessibility Secondary	Accessibility and Mobility Equal	Accessibility Only
Service Performed	Traffic movement, highest speed, no direct land access.	Traffic movement, high speed, limited land access.	Traffic movement, relatively high speed, minimal land access.	Frequent land access, relatively low speeds.	Direct land access, lowest speeds.
Typical Trip Lengths	Between regions of the North Front Range and Colorado.	Between major regions of the City.	Between and within communities.	Within communities. Connects residential and business areas to arterials.	Within neighborhoods and business centers.
Average Daily Traffic	50,000+	17,000 – 35,000	3,500 – 25,000: 4 Lane 3,500- 16,000: Two lane with center left-turn lane	1,000 – 7,000	0 – 1,500
Continuity	External – External	Internal – External	Internal – Internal	Internal – Internal	Internal Only
Access/Intersection Type & Spacing	Interchanges at 1 to 2 mile spacing, no at-grade signalized intersections. No private access.	At-grade signalized intersections at ½ mile spacing. Private access restricted.	At-grade signalized, roundabout, and stop controlled intersections at 1/8 to 1/2 mile spacing. Private access usually restricted.	Signalized, stop controlled or roundabout intersections at 1/8 mile spacing.	Stop controlled, roundabout, or uncontrolled intersections. Unrestricted private access.
Roadway Spacing	2 – 3 Miles	1 – 2 Miles	½ - 1 Mile	¼ - ½ Mile	As Needed
Bike Lane	No	Yes	Yes	Yes	No
Shared-use Path	No	Yes	Yes	Yes	No

Various roadway alternatives were tested. Some improvements included future widening of existing roadways. Other alternatives considered new or expanded routes, which would provide alternative travel corridors to the forecasted congested corridors.

Subsequent to the development of a draft forecast 2035 future year street plan, a comparison was made with the Weld County roadway plan and street plans from adjacent local jurisdictions. Based on this comparison, minor refinements were made for consistency. The plan was also reviewed by the City of Greeley's Citizens Advisory Board.

One of the objectives in the development of the Master Streets Plan was to be realistic regarding where improvements could occur. As an example, forecast travel demand along the US 34 Business and Bypass Route would suggest the widening of these facilities from four to six lanes. Given limited right-of-way, widening from four to six lanes was not deemed viable because it would result in significant impacts to adjacent development, and was, therefore, not pursued. Providing improved parallel east/west travel along other corridors, such as O Street and Crossroads Boulevard, and 37th Street and CR 52, were considered as an alternative for accommodating east/west travel and were included in the plan.

Master Street Plan Map

The resulting Master Street Plan map is shown in Figure 4-1. This map presents a vision of the ideal 2035 street improvements to accommodate the City of Greeley's 2060 Comprehensive Plan. This Master Streets Plan classifies the street network by Freeways and Expressways, Major Arterials, Minor Arterials, and Collector roadways. The Master Streets Plan map also depicts the roadway lane requirements for the classified roadways.

Locations where changes to the existing street system are proposed are highlighted to illustrate differences. The Master Street Plan also includes symbols to show where future interchanges would replace existing at-grade intersections to accommodate future peak-hour traffic turn movements. These locations are along the US 34 Bypass at 35th, 47th, 65th, 83rd, 95th, CR 17, and County Line Road.

The functional classification specifies the ultimate lane requirements, cross-section, right-of-way requirements, and other characteristics of the roadways. Based on the projected travel demand, the ultimate lane requirements for a particular street may not be required by the year 2035. However, steps should be taken to preserve the right-of-way for the ultimate cross-section as defined by the functional classification. In some cases, it may be economical and more convenient to construct the ultimate roadway lane requirements even though a lesser number of lanes may work in the interim conditions. However, annual funding limitations may require less-than-ultimate improvements.

The typical cross-section for each classification of street in the Master Streets Plan are shown in Figures 4-2A – 4-2F. These cross-sections present travel lanes, turn lanes, parking lanes, parking, parkways, and shared-use paths. The cross-sections also provide information as to how the roadway flairs out at key intersections to accommodate left and right turn lanes.

Intersection Management/Operations

The intersection is the Achilles heel of the transportation network. It is the location where two roads intersect and create conflicts, and through various forms of traffic control, including signs, signals and pavement markings, regulate who has the right-of-way through the intersection. Further complicating the intersection operation is that traffic is not limited to automobiles, but includes transit, bicycles, and pedestrians. In addition, vehicles may want to travel straight or make a left or right turn.

In general, there are four types of intersection traffic controls: the yield sign, stop sign, traffic signal, and roundabout.



Yield Sign: The Yield sign assigns right-of-way to traffic on certain approaches to an intersection. Vehicles controlled by a Yield sign need to slow down or stop when necessary to avoid interfering with conflicting traffic.



Stop Sign: The STOP sign assigns right-of-way to traffic on certain approaches to an intersection. Vehicles controlled by a STOP sign need to stop and then proceed without interfering with conflicting traffic. STOP signs should not be used for speed control. STOP signs should be installed in a manner that minimizes the number of vehicles having to stop. The two way stop sign is used where a less important road intersects or a local street intersecting with a collector or arterial. Travel speeds, restricted views or crash records are additional information considered when considering a STOP sign. Multi-way or all-way STOP control is used where the volume of traffic on the intersecting roads is approximately equal. Often the multi-way STOP control is used as an interim measure prior to traffic control signal.



Traffic Signal: Traffic signals are universally recognized for their three colors of lights, red - stop, yellow — clear, and green proceed when safe (green does not mean go). A traffic signal should only be installed unless there is a traffic engineering study that meets signal warrants and will improve the overall safety and/or operation of the intersection. A traffic signal should not be installed if it will seriously disrupt progressive traffic flow.



Roundabout: The roundabout has become an increasingly popular form of traffic control. Their advantages include: continuous movement of traffic, typically a lower average vehicle delay than a traffic signal and reduced fatalities and crashes.

All forms of traffic control should be considered when implementing the City of Greeley's Comprehensive Transportation Plan and should be based on a detailed traffic engineering study. When evaluating what traffic control option is best suited for a given intersection, the primary resource used is the Manual of Uniform Traffic Control Devices. This is the national standard for how and when devices are used.

These studies should look at both current needs and future traffic forecasts. In many cases a lesser traffic control solution such as STOP control will work for a long period. The traffic engineering study should also consider installation and ongoing operational costs, right-of-way, and overall operations. When major intersection improvements are warranted due to growth and increasing traffic volumes, staff will perform an intersection analysis to determine the best method of control. The analysis study may include accident analysis/prediction methods, calculations of existing and future delays, environmental factors, such as vehicle emissions, vegetation, wetland and noise impacts, costs, alternative mode mobility, and spatial requirements.

Figure 4-2A: Cross-Section – Major Arterials

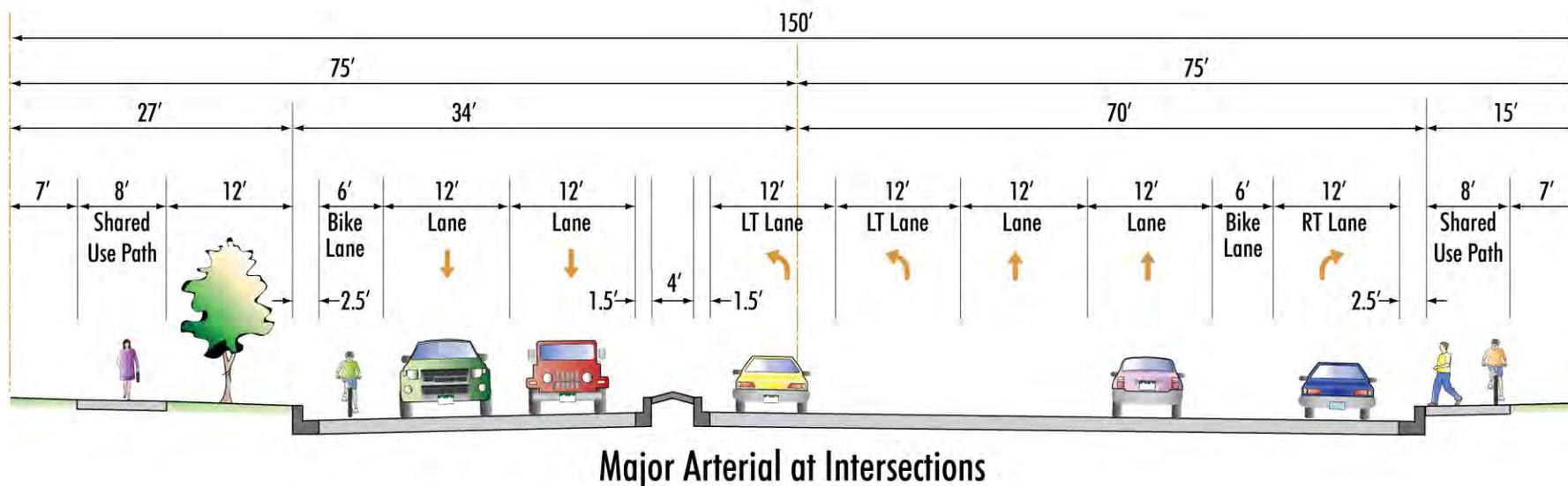
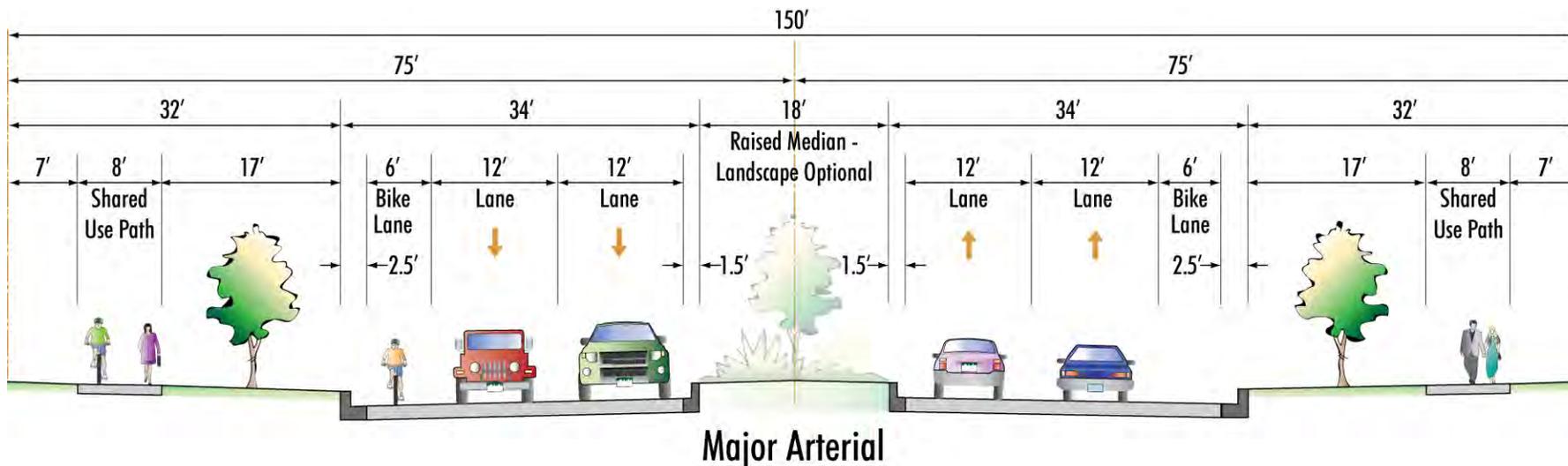


Figure 4-2B: Cross-Section – Minor Arterials – 4-Lane

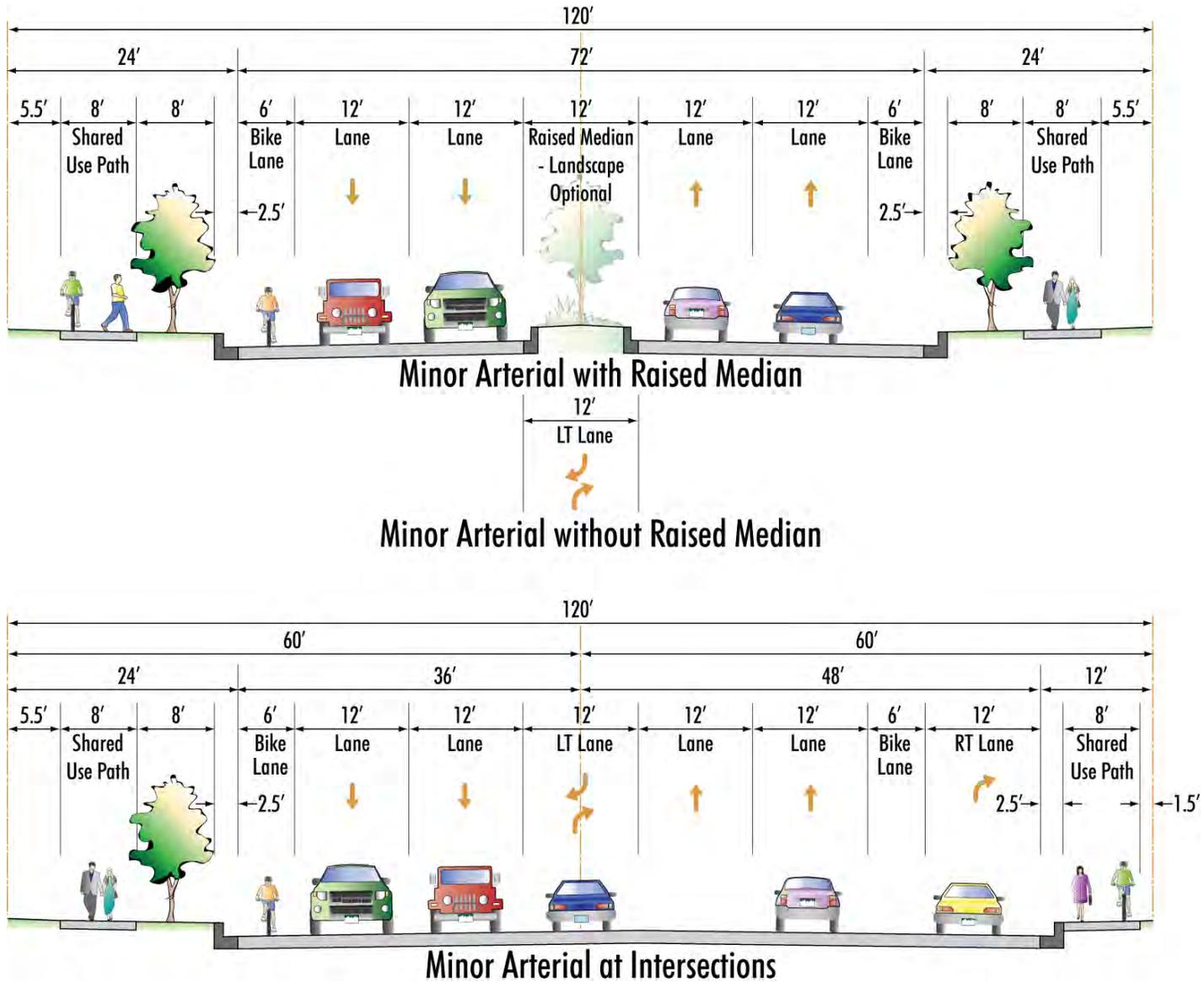


Figure 4-2C: Cross-Section – Minor Arterial – 2-Lane

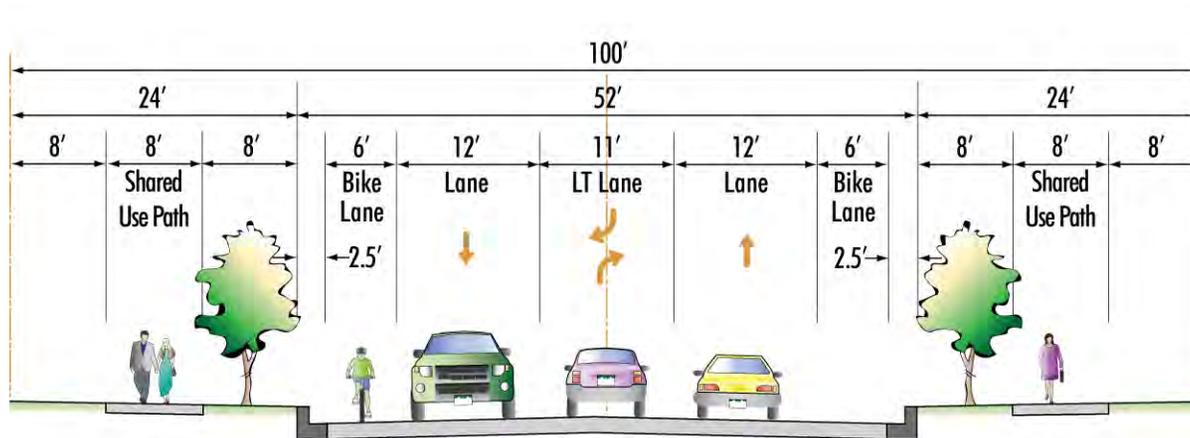


Figure 4-2D: Cross-Section – Collector

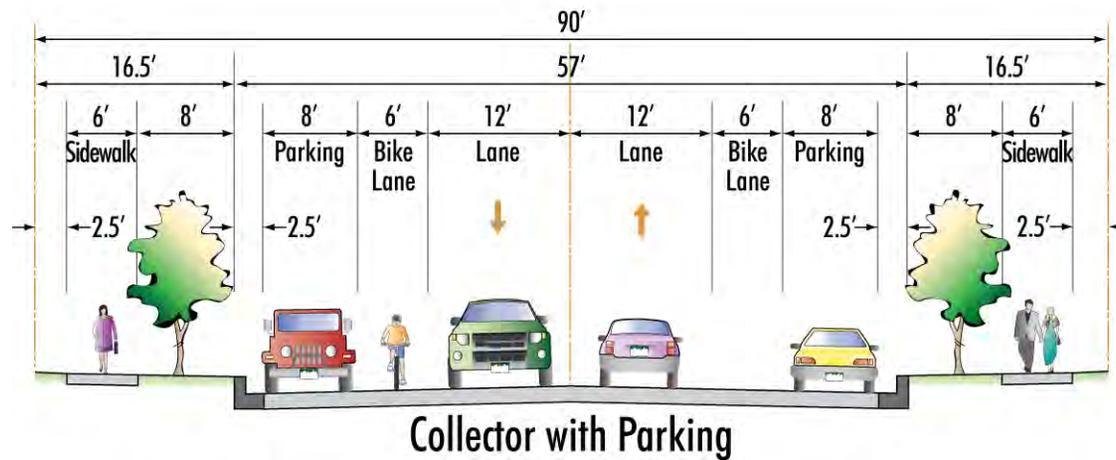
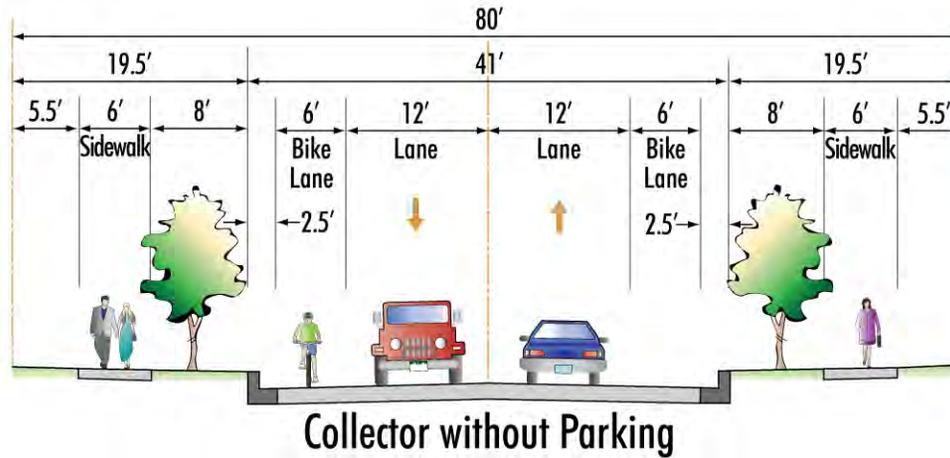


Figure 4-2E: Cross-Section – Local Commercial and Industrial Roads

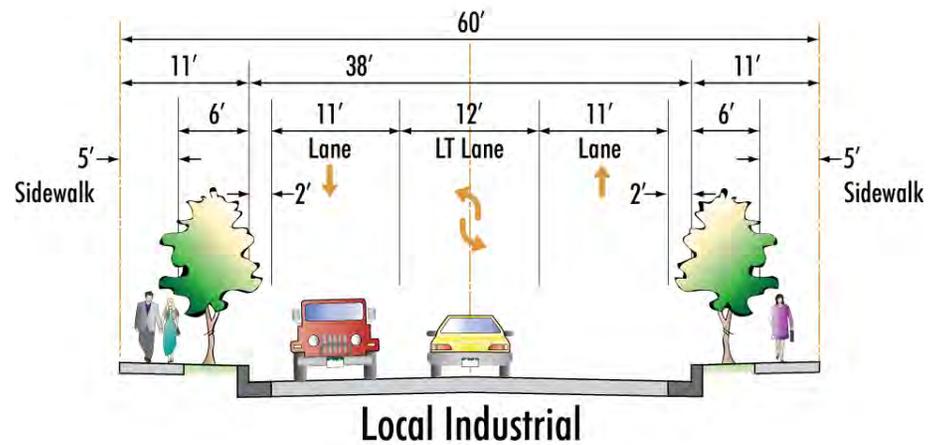
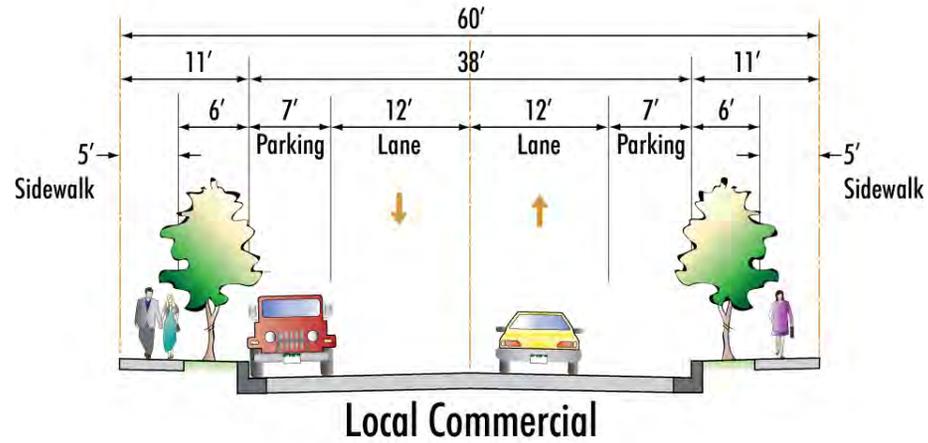
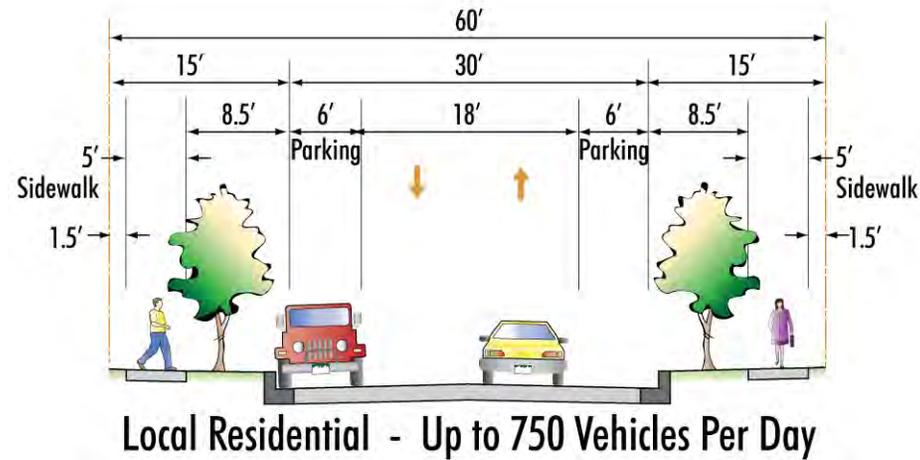
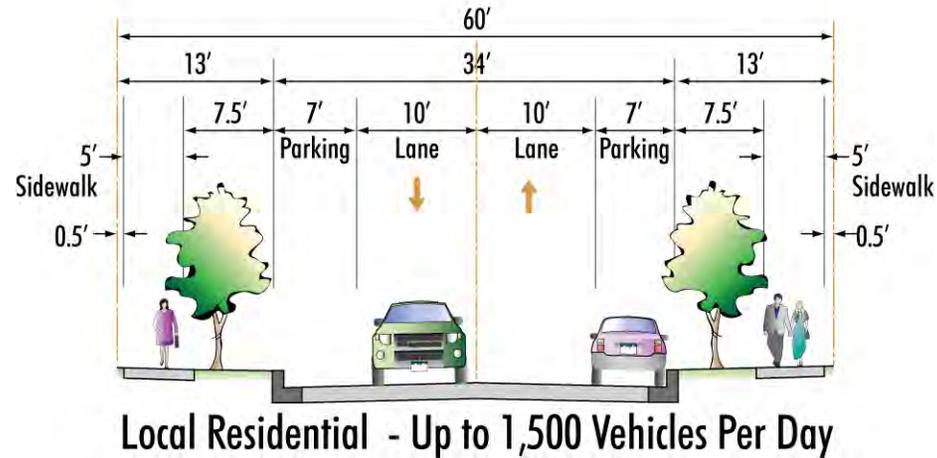


Figure 4-2F: Cross-Section – Local Residential Roads



Forecast 2035 Daily Traffic Volumes and Congestion with Master Street Plan Improvements

The 2035 forecast daily traffic volumes with the proposed Master Street Plan improvements are presented in Figure 4-3. Similar to the analysis conducted on the existing roadway network, a v/c ratio congestion analysis, using the year 2035 traffic projections on the Master Streets Plan, was also conducted and included in the figure.

The congestion level analysis was categorized into three groups: Uncongested, Congesting, and Congested.

In reviewing the map, the proposed Master Street Plan improvements would address almost all congestion levels within the City. The few areas where congestion is forecasted to occur, even with the proposed improvements, are portions along the US 34 Business Route (10th Street).

It should also be noted that congestion relief along the US 34 Bypass is contingent upon grade separation of the major intersections.

Transit Vision Plan

A major goal of the recently completed City of Greeley 2060 Comprehensive Plan was for an integrated land use and transportation system that will increase transit ridership by supporting mixed-use activity centers linked by an expanded transit service. As part of the public outreach “Connections” exercise, improved transit was identified as a one of the top priorities for the City.

A good transit system provides more than just a modal share of transportation. It can create social benefits, such as more walkable, livable, and sustainable development and safer, more equitable, and more environmentally friendly transportation. Transit can also add access by virtue of providing a convenient transportation alternative, as well as the connectivity to other modes of transportation.

The City of Greeley Transit Vision Plan is based on the Preferred Long-Term Alternative from the Greeley Strategic Transit Plan, including an additional 20,000 hours of paratransit service. The service map is included as Figure 4-4. This Transit Vision Plan has increased frequencies, as well as moderate increases in the length of service days or coverage. It also includes increased coverage and regional service. The Transit Vision Plan requires 20 fixed-route buses and an estimated eight paratransit vehicles.

Increased Frequency and Hours of Service

Increased frequency would be targeted for routes that connect existing and future activity areas that would support increased ridership. The transit service also increases the grid network that will allow users more direct connections to their destinations without having to first go to the downtown or mall transfer facilities.

In addition to the regular hours of service, demand-responsive service would be extended into the evening hours. Increased service hours and extension of demand-responsive service would bring service to more people.

Increase Transit System Coverage

With continued growth to the west, existing routes will need to be redeployed and extended to provide increased connections to these high-growth areas. Additional coverage is proposed for portions of north and south Greeley.

Expansion of the coverage into new areas will be based on a number of factors including:

- The number of persons per square mile,
- Number of jobs and square footage of retail space,
- Number of residents within 1/4 mile of planned routes, and
- Land use mix.

Figure 4-3: 2035 Forecast Daily Traffic Volumes

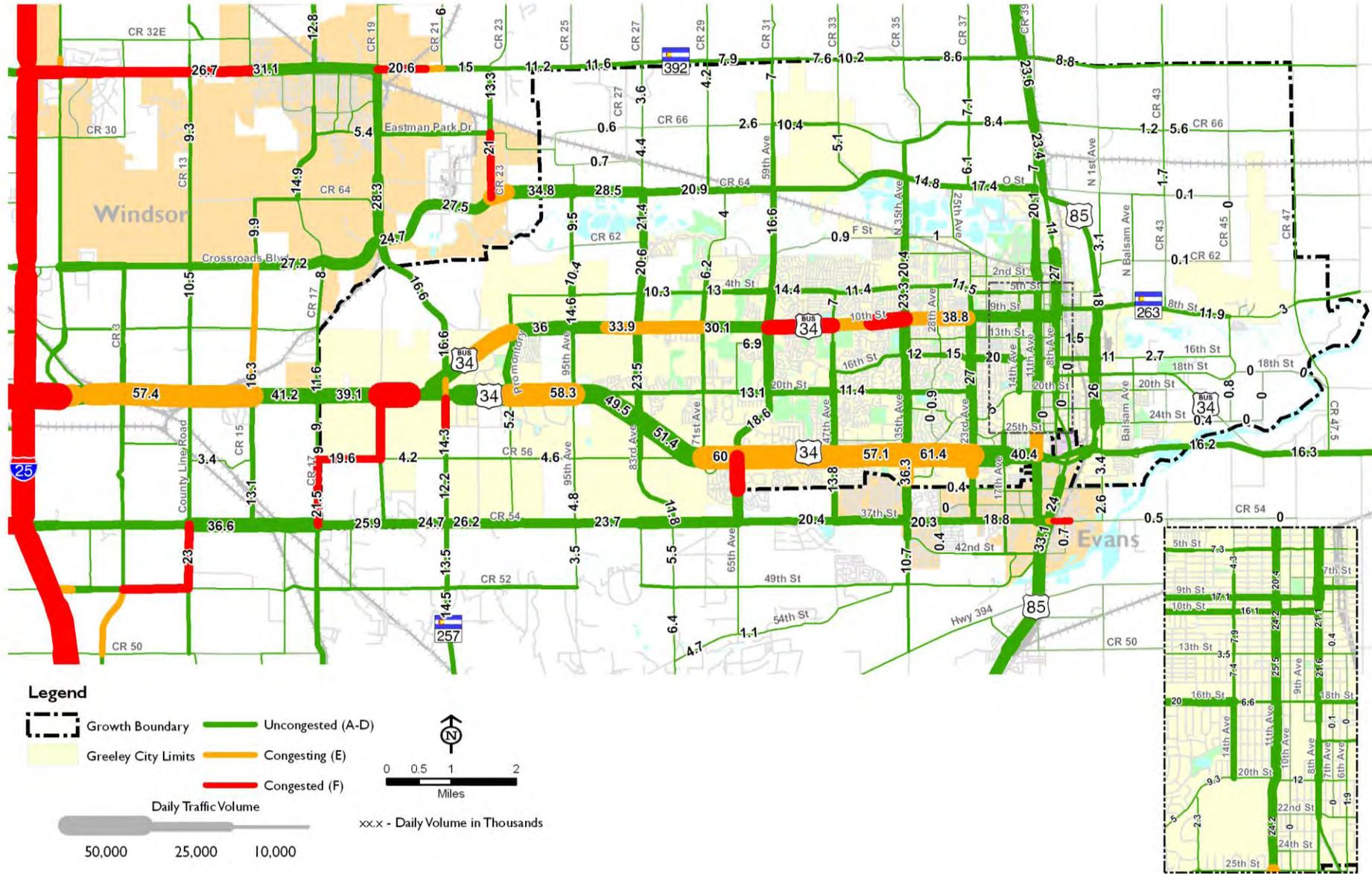
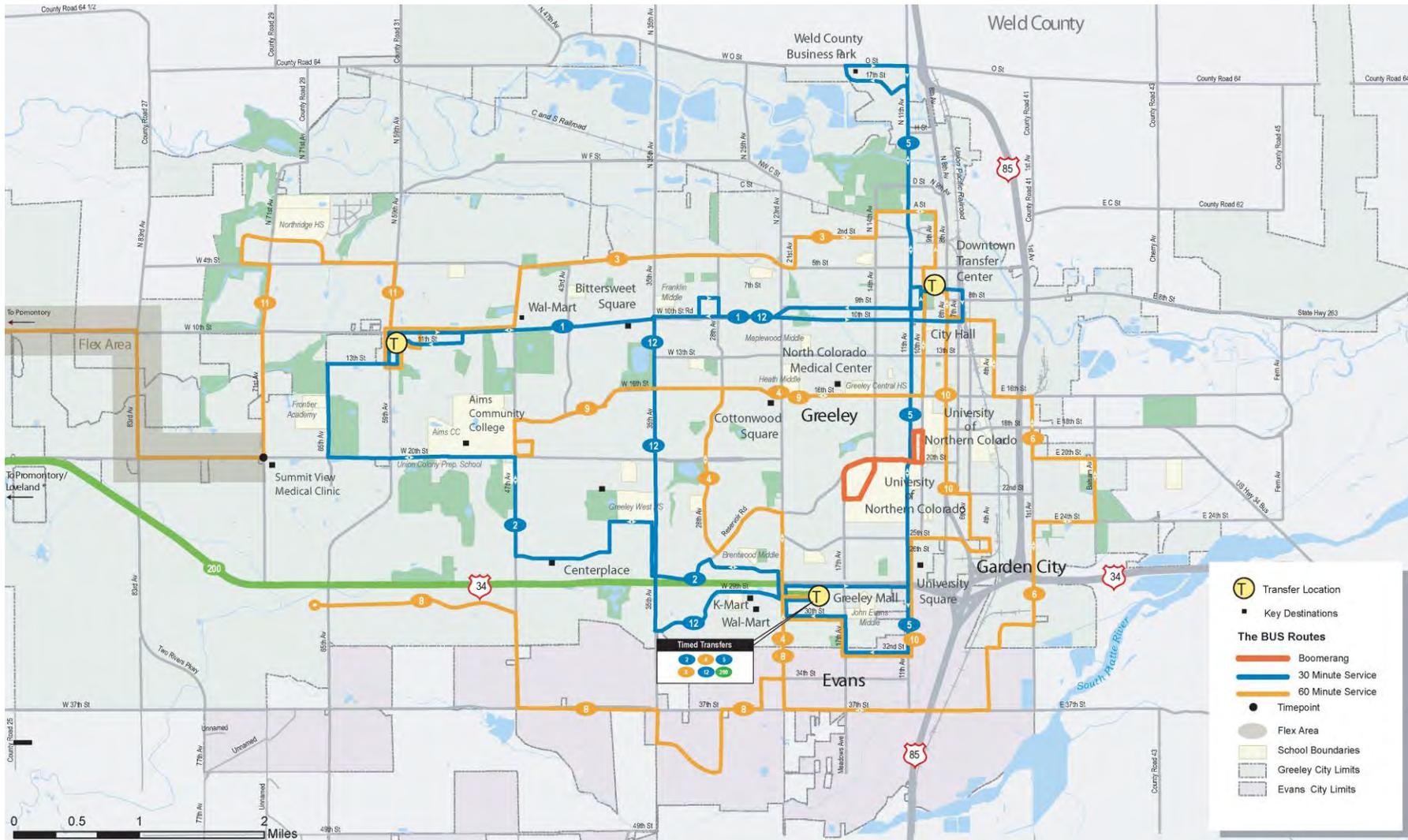


Figure 4-4: City of Greeley Transit Vision Plan Service Map



Improve Fleet and Facilities

In order to increase bus frequency and coverage, the purchase of more buses will be required. Other improvements to bus transit facilities include bus shelters, bus benches, bicycle racks, and ADA accessible sidewalks.

Integrate Transit with Other Modes

The development of Transfer Centers and Multi-Modal Centers are important means of tying together other modes of transportation with transit, thereby increasing transit usage. Transfer Centers at locations where two or more routes converge, such as the existing downtown area Transfer Center and the Greeley Mall area, could be good candidates for enhancements such as informational kiosks with bus schedules, City information, and/or SmartTrips™ information. Multi-Modal Centers at UNC and at mixed-use activity centers could provide stronger links to other modes of transportation such as pedestrian, bicycle, and future rail transit.

Improving the link between transit and bicycle is an important component of improving transit ridership. The bicycle link extends the reach of the transit coverage area. The transit service currently provides bicycle racks on buses to allow cyclists to take bicycles with them. The addition of bicycle lockers at Transfer Centers and other transfer locations could facilitate multi-modal trips by encouraging cycling to a bus stop.

An area where integration of transit with roadway, bicycle, and pedestrian improvements could result in improved safety and reduced traffic congestion is on 10th Street at the 23rd Avenue intersection.

Regional Bus Service

Many Greeley residents travel outside of the City on a daily basis to commute to work or to shop in the adjacent communities such as Loveland, Windsor, or Fort Collins. The demand for regional bus services will increase as growth throughout the region increases and there are more trips traveling into and out of the City of Greeley. As the City of Greeley grows and transit coverage area increases, providing regional connections to other services will open up the opportunity for Greeley residents work in other jurisdictions to take transit and, conversely, accommodate those living outside Greeley who work in Greeley.

Bicycle Vision Plan

As presented in Chapter 2, the existing bicycle network is very limited and does not provide a system of facilities to provide for safe and convenient bicycle travel within the City. It was also noted that, with the City's grid street system, there is a unique opportunity to provide a system of bicycle connections along lower volume roads to provide connections to activity areas, schools, parks, and other destinations.

The development of the Bicycle Vision Plan was based in part on a bicycle workshop where a large aerial map, overlaid with the existing bicycle network, was used as a base. Participants methodically went through the City and identified key bicycle destinations and potential facilities to provide bicycle access. The Bicycle Vision Plan was also refined based on input from the Citizen Transportation Advisory Board. The primary objective was to have a system of bicycle improvements that would serve bicycling opportunities for all users, including children and those with less bicycling experience.

In general, proposed bicycle facilities were recommended because they:

- Connect bicyclists to desired destinations such as employment centers, commercial districts, transit stops, schools, institutions, and recreational destinations;
- Provide the most direct and convenient routes possible;
- Provide an alternative bike route where a bicycle trail, path or lane may not be available;
- Provide facilities for less-experienced bicyclists;
- Fill in existing gaps in the bikeway network;
- Target improvements that could be implemented with ongoing facility infrastructure; and
- Lead a bicyclist to safe street crossings.

Bicycle Vision Plan Map

The Bicycle Vision Plan is presented in Figure 4-5. As shown in the figure, the Bicycle Vision Plan includes Recreational Trails, Bike Lanes and Bike Routes. Unique to the City of Greeley, the plan also includes Shared-use Paths.

Shared-use paths are 10-foot sidewalks that are shared with both pedestrians and bicycles, as well as in-line skaters, wheelchair users, and runners. This unique feature was first introduced as part of the City of Greeley 2020 Transportation Plan as part of the proposed street cross-sections. The objective of this dual system of bike lanes and shared-use paths is to provide bicycling opportunities for both the experienced bicyclist to use the bike lanes and those less experienced, including children, to have a safe shared-use path separated from street traffic.

The resulting Bicycle Vision Plan provides a very strong north/south and east/west grid of bicycling facilities, which would provide bicycling opportunities to reach all major destinations within the City. The plan also proposes lane reductions, or road diets, where lower-volume four-lane roads are converted to one lane in each direction, a center left-turn lane, and the fourth lane becoming a bike lane in each direction. As

an example, the City will be doing a road diet on 47th Avenue between 4th Street and 10th Street.

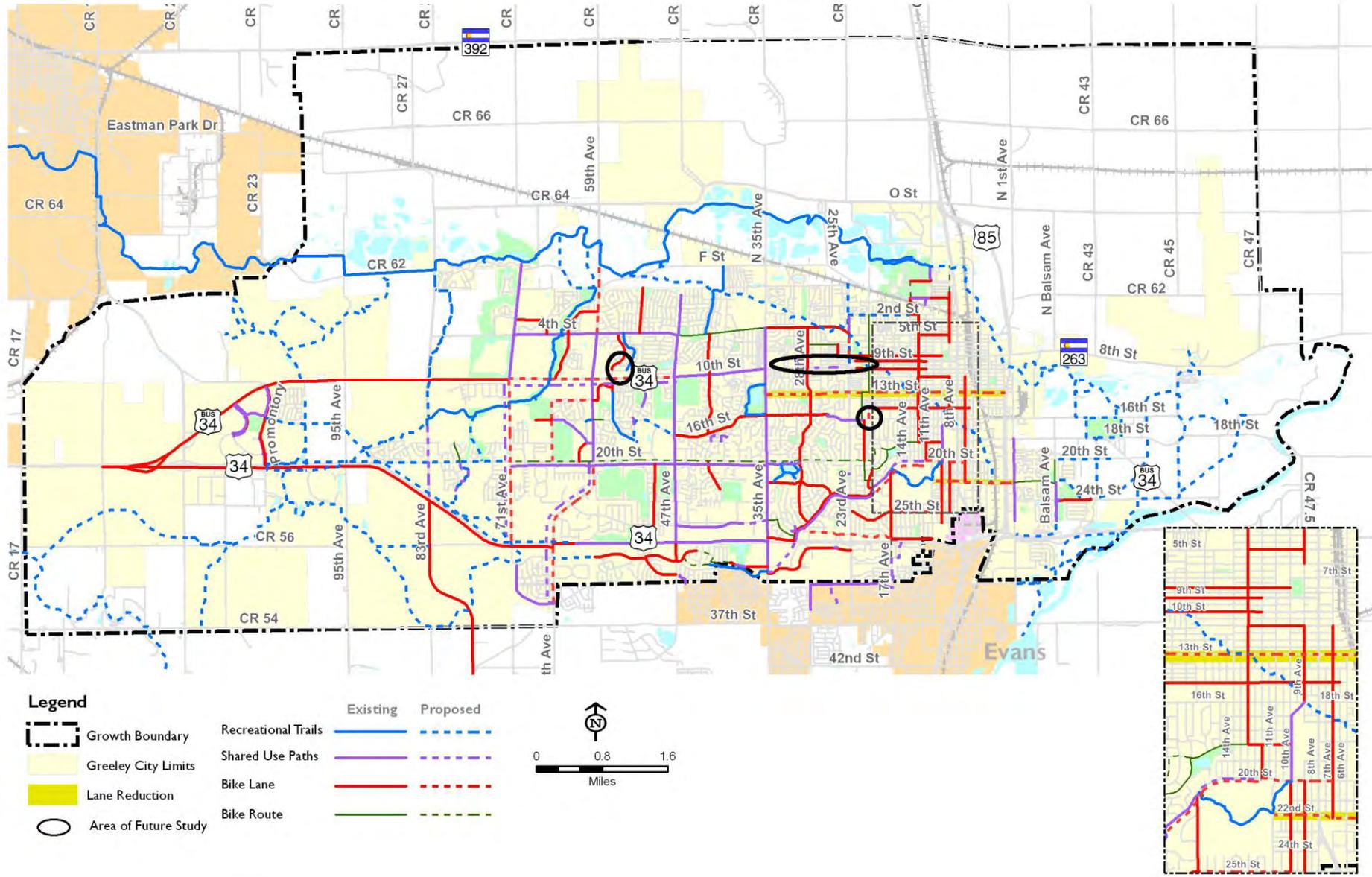
The Bicycle Vision Plan includes bicycle routes, which would be low-volume streets where the automobile and bicycle share the same roadway. These bicycle routes could include sharrows, pavement markings which notify the public that the roadway is shared by automobiles and bicycles.

In preparing the Bicycle Vision Plan Map, we discovered a few locations where a logical solution for a bicycle facility was not evident. As an example, there is a stretch along 10th Street (US 34 Business Route) where there is no reasonable location to propose a bike lane or recreation trail. The Bicycle Vision Plan Map identifies this area and others as areas of future study. It is anticipated that the area along 10th Street, as well as areas depicted in Figure 4-5, will ultimately be redeveloped. When that occurs, an east/west bicycle facility would be incorporated into the design.

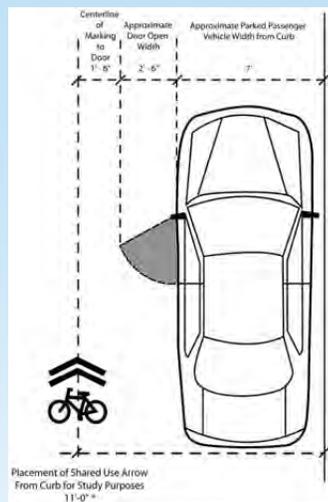
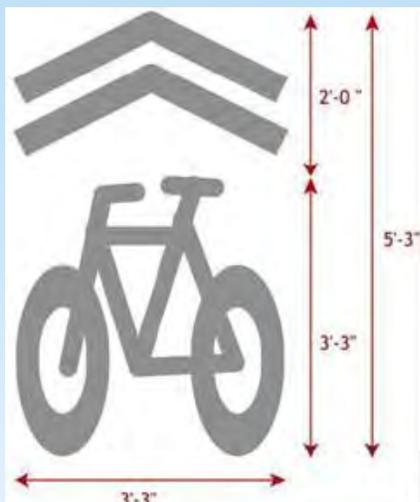
As presented in the Bicycle Vision Plan Map, there are a number of streets that are designated for both bike lanes and shared-use paths. These dual parallel bicycle facilities are part of the City of Greeley street cross-sections and provide the bike lane for the more advanced user and the shared-use path for those with less experience, children, and others who feel less comfortable riding in the street with automobiles.

The bicycle network improvements can be implemented over time. Some of the bicycle lanes and shared-use paths will be constructed as part of future roadway improvements to support land development projects. As streets are maintained over time with asphalt overlays, they can be restriped with bike lanes and pavement markings.

Figure 4-5: Bicycle Vision Plan Map



Shared Lane Use Designation “Sharrows”



Sharrows are becoming a popular form of striping bike routes on lower volume roadways that are to be shared by automobile and bicyclist and are proposed on bike routes in Greeley. Benefits of sharrows include that they:

- Encourage motorists to be more aware of bicycles.
- Increase the distance between bicyclists and parked cars.
- Increase the distance between bicyclists and passing vehicles.
- Reduce the number of sidewalk riders.
- Significantly reduce the number of wrong-way riders.

Roadway Narrowing

“Road diet” is a term used to describe the process of reducing the number of travel lanes on a given roadway. Road diets are often conversions of four-lane undivided roads into three lanes (two through lanes and a center turn lane). The fourth lane may be converted to bicycle lanes, sidewalks, and/or on-street parking. Road diets have been shown to improve mobility and access for all travel modes, enhance safety by reducing vehicle speeds, and promote economic vitality for the community. A variety of reconfigurations are possible for lane number reductions depending on the current configuration, user needs, and potential operational and safety outcomes.

Road Diet

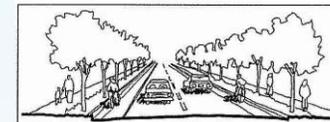


Before



After

Along with lane elimination, roadway lane narrowing may also help to reduce vehicle speeds and enhance movement and safety for pedestrians and bicyclists. Lane narrowing is best used where motor vehicle speeds are low.



Before (top) and after (bottom) width of lanes is reduced.

Maintenance

Broken glass and debris tend to accumulate near curbs where bicyclists ride, resulting in flat tires and accidents. Certain streets become mud-covered after rain, making the riding surface hazardous, while others are prone to icy conditions. Painted lanes delineating bike routes wear off over time and are no longer usable without proper upkeep. During the winter months, snow gets plowed either onto the right-most edge of the roadway (which forces bicyclists to ride father left) or off the roadway and onto the sidewalks.

Consistent upkeep and maintenance of bikeways should be top priority. On-street routes and lanes need to be regularly swept of debris. Bike lane lines should be repainted at least as regularly as those on the rest of the street. Weather-related obstacles such as ice and mud cannot be eliminated but can be minimized through good design practices. Bikeway segments that regularly have these problems should be identified and corrected when and where it is possible. It is recommended that all paths that are part of the bicycle system be paved.

The 5 E's – Engineering, Education, Enforcement, Encouragement, and Evaluation

Facilities are only one of several elements essential to building a successful bicycle and pedestrian planning transportation system. Bicycle and pedestrian safety education and training that encourages walking and bicycling and enforcing the rules of the road, as they pertain to bicyclists, pedestrians and motorists should be combined with facilities development to form a comprehensive approach to bicycle and pedestrian use. The Colorado Guide for the Development of Local and Regional Bicycle and Pedestrian Plans identifies the 5 E's - Engineering, Education, Encouragement, Enforcement, and Evaluation – as the basis for comprehensive bicycle and pedestrian planning.

- **Engineering.** Engineering includes facilities, maintenance, and parking. An adequate bicycle or pedestrian transportation system is one that allows users with varying abilities to safely and efficiently travel from origin to destination. Bicycle facilities include on-street facilities such as bike lanes, bike routes, low-volume roads and roads with adequate shoulders, and off-street facilities such paths, bridges, overpasses, and underpasses.
- **Education.** Education of the public is the most important element in reducing bicyclists and pedestrian injuries, reducing hostility between the various transportation modes, ensuring that the law is obeyed, and ensuring that facilities are properly designed and built. Bicyclists, pedestrians, and motorists need safety education. Police officers need education regarding the manner in which to enforce bicycle and pedestrian laws, and engineers and planners need facility design education.
- **Encouragement.** Encouraging bicycling and walking can help mitigate air pollution and traffic congestion, as well as promote healthier, friendlier communities. One-way trips of five miles or less are often suitable for bicycling. Often bicyclists are willing to travel even farther distances for commuting trips or recreation. Shorter trips are often suitable for walking. Providing safe, well-designed and maintained facilities encourages bicycling and walking. Annual events, such as Metro Rides Bicycle and Trails Festival, CDOT's Colorado Bike Month (June), Bike to Work Day, Colorado Pedestrian Month (October), Walk to School Day, and National Trails Day promote bicycling and walking through events and media attention. These events are designed to celebrate non-motorized transportation, encourage people to bicycle or walk, build awareness through safety campaigns in the media, and institutionalize bicycling and walking as viable modes of transportation.

- **Enforcement.** Enforcement goes hand in hand with education. Education is not effective if there is not enforcement to back it up. Therefore, it is important to enforce the rights and responsibilities of all modes of transportation by ticketing motorized and non-motorized transportation users alike. Bicyclists and pedestrians should be expected to be ticketed for traffic offenses just as motorists are.
- **Evaluation:** Evaluation involves monitoring outcomes and documenting trends through data collection before and after transportation improvements. Evaluation includes review of existing policies and standards, monitoring traffic volumes and flow, evaluating crashes, prioritization of future projects and identifying potential funding sources.

Bicycle Parking and Storage

Convenient and secure bicycle parking should be provided at the destination end of a trip. Inadequate bicycle parking facilities and fear of theft are major deterrents to bicycle transportation. A sufficient supply of effective bicycle parking requires a properly designed rack in an appropriate location for the type of use.



Racks should be highly visible so bicyclists can spot them immediately when they arrive from the street. A visible location also discourages theft and vandalism. Adequate lighting and surveillance is essential for the security of the bicycles and the users. Bicycle racks and lockers must be well anchored to the ground to avoid vandalism and theft.

Bicycle lockers should be provided at locations such as transit transfer facilities, parking garages, and employment centers.

Adequate clearance is required around racks to give bicyclists room to maneuver, and to prevent conflicts with pedestrians or parked cars. Racks should not block access to building entrances or fire hydrants.

Bicycle facilities should be designed in accordance with Chapter 2 of the AASHTO Guide. Bicycle parking may be provided in floor, wall, or ceiling mounted racks. Bicycle parking facilities should meet these requirements:

- Holds the bicycle frame, not just a wheel;
- Can be used with a U-shaped shackle lock;
- Accommodates a wide range of bicycle sizes, wheel sizes and types;
- Is covered with material that will not chip the paint of a bicycle that leans against it; and
- Does not have hazards, such as sharp edges.



There are many types of bicycle racks and lockers available. Some are suitable for certain situations but not others, and some designs are suitable anywhere. There are two general categories of bicycle parking requirements:

- **Long-Term (Class I)** parking is needed where bicycles will be left for hours at a time. It requires a high degree of security and weather protection, with well-designed racks in covered areas, lockers, storage rooms, or fenced areas with restricted access.
- **Short-Term (Class II)** parking is needed where bicycles will be left for short stops. It requires a high degree of convenience (as close to destinations as possible). At least some short-term bicycle parking should be protected from the weather (a portion can be unprotected, since demand tends to increase during dry weather). This can use an existing overhang or covered walkway, a special covering, weatherproof outdoor bicycle lockers, or an indoor storage area.

Table 4-2 provides a guideline for parking spaces per land use category for new development or property which requires a change-of-use permit.

Table 4-2: Recommended Minimum Bicycle Parking Requirements

Type of Establishment	Minimum Number of Bicycle Parking Spaces
Primary or Secondary School	10% of the number of students, plus 3% of the number of employees.
College or University Classrooms	6% of the number of students, plus 3% of the number of employees.
Commercial – Retail or Office	One space per 3,000 sq. ft. of commercial space or 5-10% of the number of automobile spaces.
Sport and Recreation Center	10-20% of the number of automobile spaces.
Movie Theater or Restaurant	5-10% of the number of automobile spaces.
Industrial	2-5% of the number of automobile spaces.
Multi-Unit Housing	1 space per 1-2 apartments.
Public Transit Stations	Varies, depending on usage.

Multi-Modal Connectivity

Enhancing the link between bicycles and transit, bicycles and pedestrians, and bicycles and automobiles, in combination with end-of-trip facilities, will improve overall connectivity within the City.

Traditionally, transit users are identified within approximately ¼ mile of a bus stop. Depending on one’s ability, the bicycle can extend this distance to well over a mile; thus it is particularly important to provide linkages between bicycles and transit in those areas with limited transit access. By encouraging the use of bicycles as access to transit, GET can increase ridership levels and serve a larger area while minimizing costs.

The additional integration of bicycles with pedestrians and automobiles simply magnifies the potential for multi-modal transportation strategies to be successful. The multiple components of the urban transportation system have a tremendous ability to complement each other in several ways. A bicyclist who uses transit and a pedestrian who incorporates bicycling can easily extend the range of travel without accruing a tremendous increase in travel time. An automobile driver who combines his trips with bicycling can still receive all of the benefits of bicycling, particularly if the trip was at a distance that deterred him from bicycling at all. There are many benefits to the bicyclists and the community when multi-modal transportation choices are made.

Bicycling and walking are also a great combination. For example, after bicycling downtown and locking up one’s bicycle, a resident can walk through downtown to shop and eat. A bicycle that is equipped with baskets or panniers allows the bicyclist to carry goods home as well.

Pedestrian Vision Plan

Both ends of all automobile trips, transit trips, and bicycle trips are walking trips. For the automobile trip, the driver or passenger must walk from the parked car on the street or parking lot to the final destination. The person taking transit must walk to the transit stop and be able to safely cross streets to reach his/her destination. Even a bicycle trip includes a walk trip from where the bicycle is parked. Providing a pedestrian network to get to these destinations require simple, yet important considerations for accommodating that pedestrian trip.

The accommodation of pedestrian travel is also integral to the community's vitality and quality-of-life. Planning for the interaction of pedestrians and other modes of travel is essential not only for safety, but also for the convenience of this mode of travel.

As presented in Chapter 2: Existing Transportation Conditions, the City of Greeley has done very well in accommodating the pedestrian trip with a grid street system and sidewalks on almost every block. The issues raised were availability of safe crossings of higher-volume and higher-speed arterial streets and non-direct connections, particularly in some of the newer development areas.

The Pedestrian Vision Plan, therefore, proposes basic guidelines for future private and public development. Following these guidelines are particularly important in high pedestrian activity or use areas:

- Mixed-Use and Commercial Activity Areas
- Routes to Schools and Parks
- Connections to Transit

Sidewalk Improvements on City Streets

The City of Greeley's street cross-sections require sidewalks on both sides of all roadways from Local Streets to Arterials. Some of these facilities are shared-use facilities with the bicycles. As new roadways are

planned and constructed, these improvements should be provided and not waived.

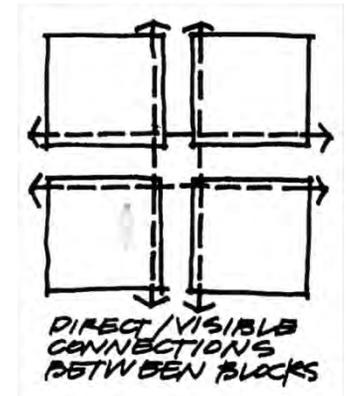
Pedestrian Facility Requirements

The parking and circulation system within each development should accommodate the movement of vehicles, bicycles, and pedestrians throughout the proposed development and to/from surrounding areas, safely and conveniently. Walls, fences, and barricades should not restrict access to adjacent uses, particularly for public uses such as schools, parks, and recreational areas.

To the maximum extent feasible, the following guidelines should be incorporated into the design of all new private developments and/or public streets to ensure safe and convenient pedestrian access into and within the site, with minimum potential for conflict with motor vehicles. These design elements complement the five measures of pedestrian level of service: Directness, Continuity, Street Crossings, Visual Interest and Amenity, and Security.

Directness

Sidewalks within the site should be located and aligned to directly and continuously connect areas or points of pedestrian origin and destination, and they should not be located and aligned solely based on the outline of a parking lot configuration that does not provide such direct pedestrian access. To the maximum extent feasible, walkways and bicycle connections should provide the most direct access route between intended points of travel.



Continuity

Sidewalks should provide a continuous and understandable pedestrian network that links schools, neighborhoods, parks, activity centers, and other popular destinations. In order to provide such a network, the City should require additional sidewalks, walkways, or bike paths not associated with a street, or the extension of a sidewalk from the end of a cul-de-sac to another street or walkway and connections between developments. When necessary to assure the public's safety in using on-site or connecting pedestrian sidewalks, the City should require a developer to provide on-site or off-site pedestrian overpasses, underpasses, or traffic signalization.

Street Crossings

The City of Greeley should develop safe, comfortable, and attractive street crossings. Intersections crossing multiple lanes require pedestrian enhancements. If it is determined that the traffic demand warrants additional through or turn lanes, then pedestrian mobility should be evaluated to find whether or not additional pedestrian enhancements should be required to offset the traffic impacts on the pedestrian. As part of the land development plan, internal sidewalks should align with future pedestrian street crossings.

Visual Interest and Amenity

Future construction of City streets and development plans should include basic amenities that enhance safety and convenience and promotes walking. Well-designed walking environments are enhanced by urban design elements and landscaping, including street trees to provide a shade canopy.

Security

The pedestrian network should provide for a secure pedestrian setting by being well lit and visible to others through direct line of site.

Hazardous Material Routes

Hazardous materials (Hazmat) are defined as “a substance or material which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and which has been so designated. The term includes hazardous substances, hazardous wastes, marine pollutants, and elevated temperature materials...” Historically, US 34 Bypass and US 85 Bypass have been the designated Hazmat routes, since these routes provide a continuous route around major residential areas of Greeley. A map of the Hazardous Materials Routes is presented in Figure 4-6.

Traffic Signal Design and Operation

No other traffic control device has such a daily impact on virtually every citizen as does the common, ever-present traffic signal. The proper operation of appropriately designed signals has many potential benefits, including:

- Increased capacity and traffic-handling capability of an intersection
- Reduced vehicle delay
- Improved traffic flow on the arterial streets
- Reduced frequency of certain types of accidents
- Safety benefits to pedestrians

There are also negative impacts when unwarranted traffic signals are installed; these include:

- Increased vehicle delay and increased pollution
- Increases in rear-end types of crashes
- Increased traffic on neighborhood streets to avoid congestion at signalized intersections

It is anticipated that the number of signals will continue to increase with the projected growth in the Greeley area. Therefore, principles for the placement and management of traffic signal systems are defined as follows:

- Traffic signals have a very high annual cost of maintenance cost and are often not the best design solution for accommodating forecast traffic demand. Alternatives such as the Modern Roundabout can provide increased performance and reduced operating costs and should be contemplated for any intersection which may be under consideration for a signal.
- The decision to install a traffic signal should be based on a thorough investigation of physical and traffic flow conditions at the potential site.
- Placement of new traffic signals shall be determined by a traffic engineering study that evaluates the benefits, as well as the negatives.
- New traffic signals shall not be approved without traffic signal warrants being met.
- New traffic signals shall not be installed without progression analysis; demonstrating that they will not negatively impact existing signal operations along the corridor.

Traffic signal operations should be based on traffic volumes, turning movement demand, and the geometry of the intersection. The City should do the following:

- Review the traffic signal timing plans periodically, at least once every year for the major intersections and once every two years for minor intersections. Turning movement counts will need to be recorded on a routine basis for this purpose.

- Verify that the yellow-to-red clearance and pedestrian intervals at all intersections are adequate. These intervals will also be reviewed when new construction is completed at an intersection.
- Review the left-turn phasing requirements at all intersections, and where needed, install left-turn lanes and signal hardware for protected or permissive signal phasing.
- Evaluate traffic signal timing plans for the morning, mid-day, evening, and off-peak periods.
- Review pedestrian movements.

Intelligent Transportation Systems (ITS)

With the recent advent of Intelligent Transportation Systems (ITS), the use of these technologies has been spreading quickly. ITS technologies include the application of advanced sensor, computer, communications, and video to monitor and manage traffic and transit. These technologies have been used to optimize existing transportation facilities and improve the flow of the traffic.

Recommended ITS actions include:

Develop an ITS Plan for the Greeley Area

- Implement vehicle detection at signalized intersections.
- Install closed circuit television cameras at key intersections, major activity centers, and congested arterials.
- Install fiber-optic cable in roadway right-of-way.
- Develop traveler information systems.

- Establish a Traffic Operations Center that would be the control center for these elements.
- Develop means of coordination with other modes via ITS.

Develop a Regional ITS Plan

- Access to data from Fort Collins, Loveland, Denver, and CDOT Region 4.
- Connections to CDOT Variable Message Signs in the Greeley area.

Chapter Contents

- Transportation Funding
- Transportation Policies and Actions

The City of Greeley 2035 Transportation Vision Plan presented in Chapter 4 identified the recommended transportation improvements to support future development as identified in the City’s 2060 Comprehensive Plan.

The chapter presents the implementation strategies to get there.

Like any implementation plan, these steps can be difficult and controversial. Providing adequate funding to reach this vision is critical and is probably the most important issue the City must address. Implementing a successful plan also includes changes and updates to various policies and actions.

The following implementation chapter is intended to identify the key funding issues facing the City in being able to implement the transportation improvements necessary to accommodate future growth and to identify transportation policies and actions that will lead to a successful plan.

Transportation Funding

The City of Greeley Transportation Vision Plan in Chapter 4 presents a vision of transportation needs and desires to support 2030 growth. However, this vision is not constrained by available funding. Therefore, this chapter provides an assessment of the future transportation system and how it will perform, based on current funding levels options for future funding, and what might be accomplished with additional funding.

Master Street Plan

The Master Street Plan presented in Chapter 4 identified street improvements to accommodate 2035 development as identified in the City’s 2060 Comprehensive Plan. These street improvements included new streets, widening of existing streets, and other improvements to existing streets. The proposed improvements and planning level costs are presented in Table 5-1. The total cost of these street improvements is approximately \$327 million.

The Master Street Plan includes federal and state roadways within the City, including widening of SH 257 from two to four lanes and six interchanges along the US 34 Bypass to mitigate forecast intersection turn-movements congestion. Historically, the federal and state road improvements have not been funded through local jurisdictions, and are the responsibility of the State of Colorado Department of Transportation. If these federal and state improvements are not included in the costs, then the total Master Street Plan costs for the City of Greeley would be approximately \$177 million.



Table 5-1: Greeley Transportation Plan Alternatives

Street Name	Improvement	Alternatives		
		1 MASTER STREET PLAN (All Street Improvements)	2 MASTER STREET PLAN (No State or Federal Roadway Improvements)	3 MINIMUM ROADWAY IMPROVEMENT PLAN
		Costs (\$ mil)	Costs (\$ mil)	Costs (\$ mil)
11th Ave from O St to US 85	2 to 4 lanes	\$3.5	\$3.5	
35th Ave from O St to 4th St	2 to 4 lanes	\$6.0	\$6.0	
59th Ave from F St to CR 64	2 to 4 lanes	\$3.5	\$3.5	
4th St from 83rd Ave to 71st Ave	2 to 4 lanes	\$3.5	\$3.5	\$3.5
83rd Ave from CR 54 to CR 64	2 to 4 lanes	\$14.0	\$14.0	
	2 to 3 lanes			\$7.0
4th St from CR 23 to 83rd Ave	New Road - 4 lanes	\$9.0	\$9.0	\$9.0
20th St from 83rd Ave to 71st Ave	2 to 4 lanes	\$3.5	\$3.5	
CR 54 from 35th Ave to CR 17	2 to 4 lanes	\$15.9	\$15.9	
	2 to 3 lanes			\$6.8
CR 56 from US 34 Bypass to CR 17	New Road - 2 lanes	\$21.0	\$21.0	\$21.0
New Road from US 34 to CR 54	New Road - 2 lanes	\$7.0	\$7.0	\$7.0
O St from SH 85 to 83rd Ave	2 to 4 lanes	\$21.7	\$21.7	
	2 to 3 lanes			\$4.7
O St from 83rd Ave to CR 23	New Road - 4 lanes	\$9.5	\$9.5	
	New Road - 3 lanes			\$7.4
Promontory Pkwy North from US 34 Business (10th St) to 4th St	New Road - 2 lanes	\$1.8	\$1.8	\$1.8
Promontory Pkwy South from CR 54 to US 34 Bypass	New Road - 2 lanes	\$7.0	\$7.0	\$7.0
65th Ave from US 34 Bypass to WCR 54	2 to 4 lanes	\$3.0	\$3.0	\$3.0
WCR 27 from CR 64.5 to SH 392	New Road - 2 lanes	\$5.6	\$5.6	
WCR 47.5 from 18th St to SH-263	New Road - 2 lanes	\$4.9	\$4.9	
59th Ave from US 34 Bypass to 20th St	2 to 4 lanes	\$3.5	\$3.5	\$3.5
59th Ave from 4th St to C St	2 to 4 lanes	\$2.4	\$2.4	\$2.4
83rd Ave from US 34 Business (10th St) to US 34 Bypass	2 to 4 lanes	\$5.9	\$5.9	\$5.9
71st Ave from US 34 Bypass to 10th St & South of O St	New Road - 2 lanes	\$9.5	\$9.5	\$9.5
95th Ave from CR 54 to O St	New Road - 2 lanes	\$14.0	\$14.0	\$14.0
47th Ave from F St to W B St	New Road - 4 lanes	\$1.1	\$1.1	\$1.1
US 34 Bypass Interchanges	6 interchanges	\$150.0		
Total		\$326.7	\$176.7	\$114.5

State and federal funding has been severely limited, and there will likely not be funding available for these improvements. Therefore, in order to determine what the impact would be to the City of Greeley if these improvements were not made, a travel model run was conducted. The future network for the Master Street Plan without state or federal roadway improvements is presented in Figure 5-1. The resulting 2035 daily traffic volumes and congestion is presented in Figure 5-2.

As would be expected, the congestion along the US 34 Bypass will significantly increase without grade separated interchanges at the major cross streets. It should also be noted that, because of this congestion, there will be some redistribution of traffic to parallel facilities; however, no additional major congestion areas were identified.

Although the proposed Master Street Plan, without the state and federal roadway, reduces the cost from \$327 million to approximately \$177, the City of Greeley does not have the revenues to fund these improvements. Based on the current transportation impact fee schedule applied to the projected 2035 growth from the City of Greeley's 2060 Comprehensive Plan, the City would generate approximately \$100, or about one-half what would be needed.

In order to address this shortfall, a Minimum Roadway Improvement Alternative was developed. In the event that full improvements could not be afforded, there might be some interim improvements that would mitigate the majority of traffic impacts. Specific examples include reducing the future planned improvements for a four-lane street (with a left-turn median, curb, gutter, landscaped parkway, and shared-use path) to an interim improvement, such as a three-lane section with one lane in each direction and a center left-turn lane.

Based on the 2035 traffic forecasts, a number of roadway improvements were identified that might be reduced from the ultimate improvements to an interim improvement and still provide acceptable congestion levels. The Minimum Roadway Improvement Alternative is presented in Figure 5-3. As presented in Table 5-1, the cost of this alternative is approximately \$114 million, which is closer to the anticipated revenues that will be collected with the current transportation fee program.

The resulting 2035 Daily Traffic Volumes and Congestion map is presented in Figure 5-4. In general, the overall congestion has not significantly increased. Whereas there are some segments of roadways that might have gone from uncongested to congesting or from congesting to congested, the majority of roadway segments did not change.

It should be noted, however, that this scenario not only reduces the number of travel lanes, but also eliminates the sidewalk, bicycle facilities, and landscaping.

It should further be noted, that the current transportation fee collected in the City of Greeley is approximately one-half the transportation fee collected in Fort Collins and Loveland. If the City of Greeley were to double its transportation fee to be in line with the other jurisdictions, all City roads could be constructed with the pedestrian and bicycle facilities and landscaping to accommodate the 2035 Comprehensive Transportation Plan forecasts.

Figure 5-1: Master Street Plan without State and Federal Improvements

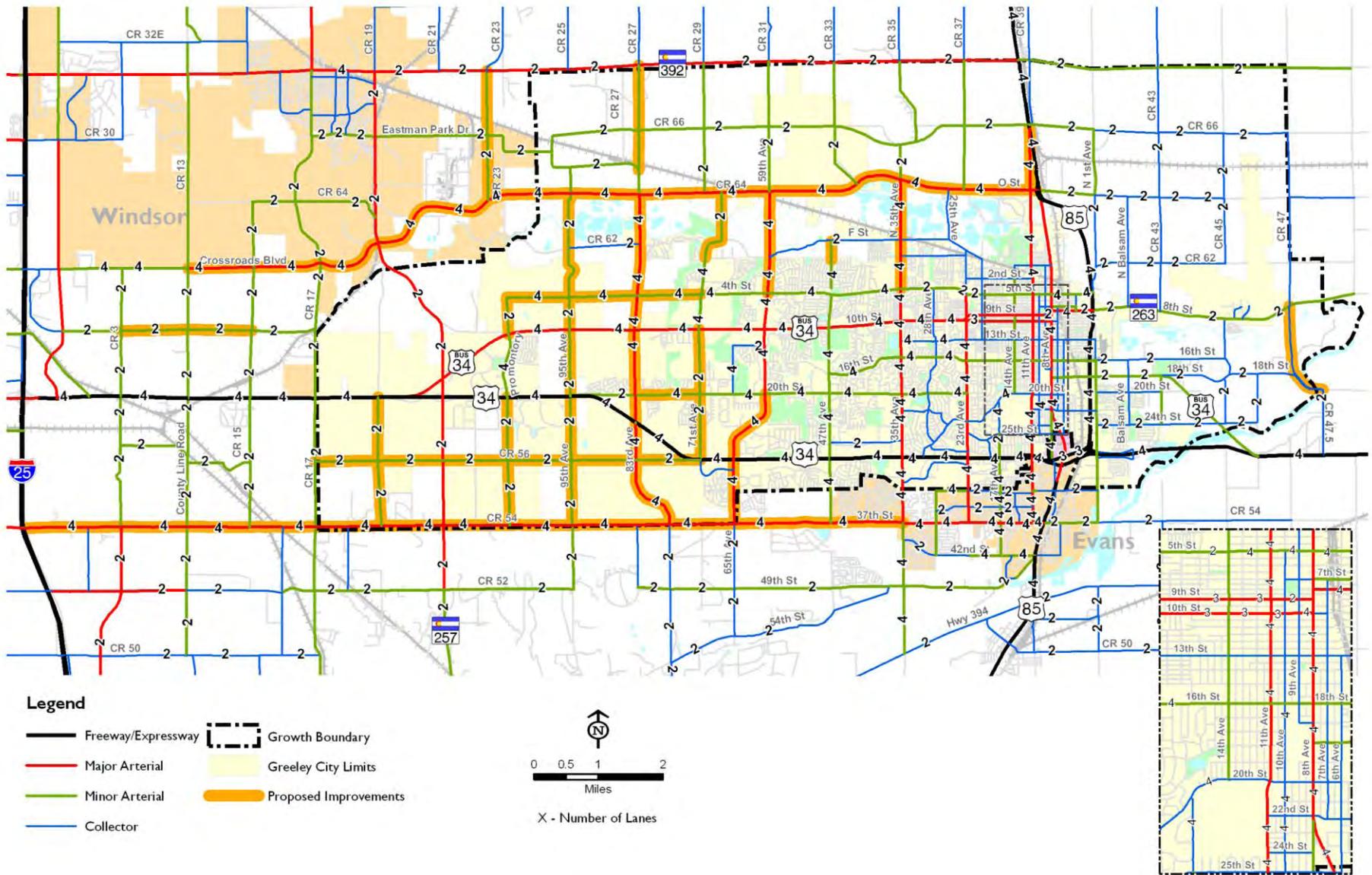


Figure 5-3: The Minimum Roadway Improvement Alternative

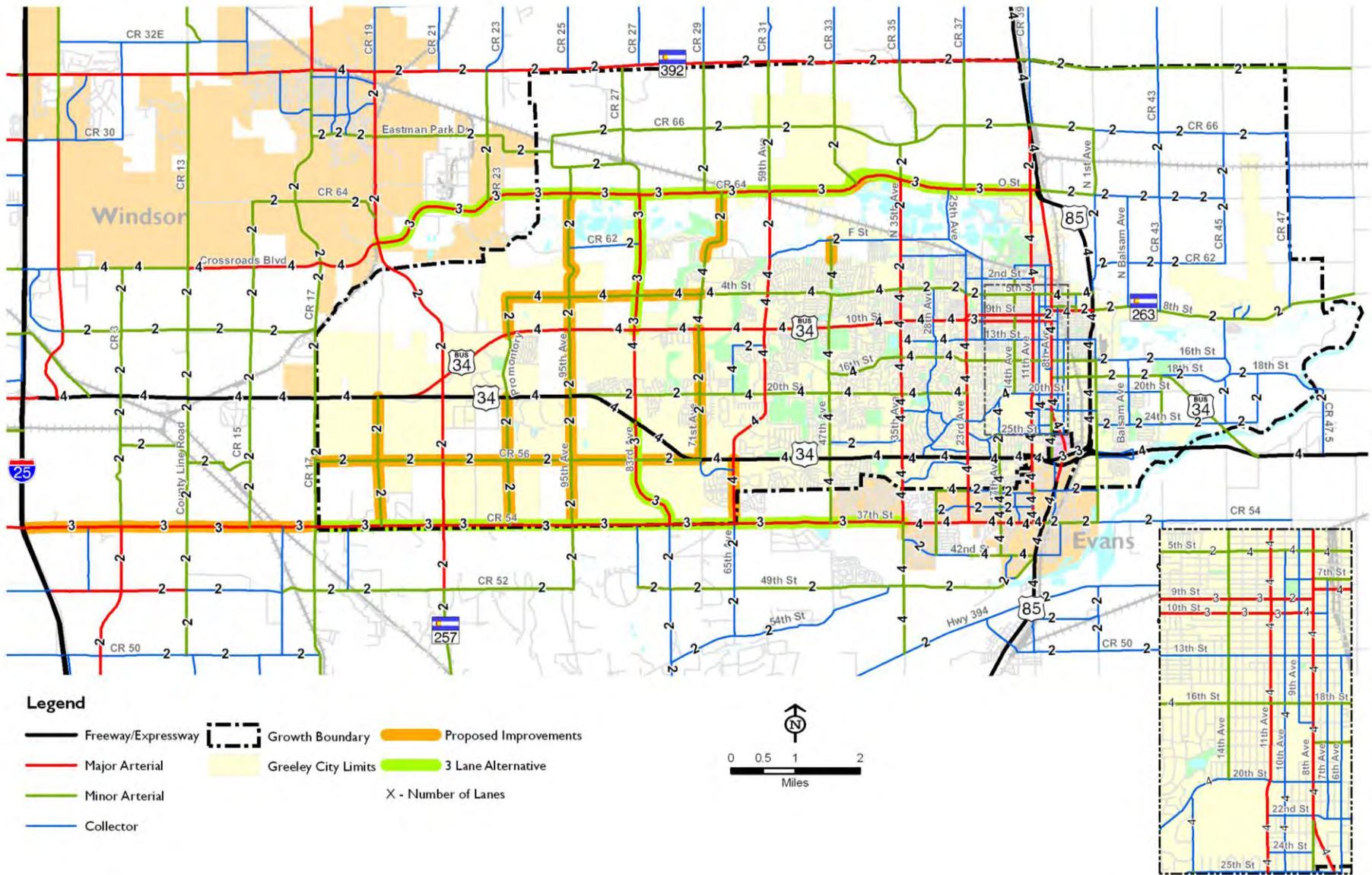
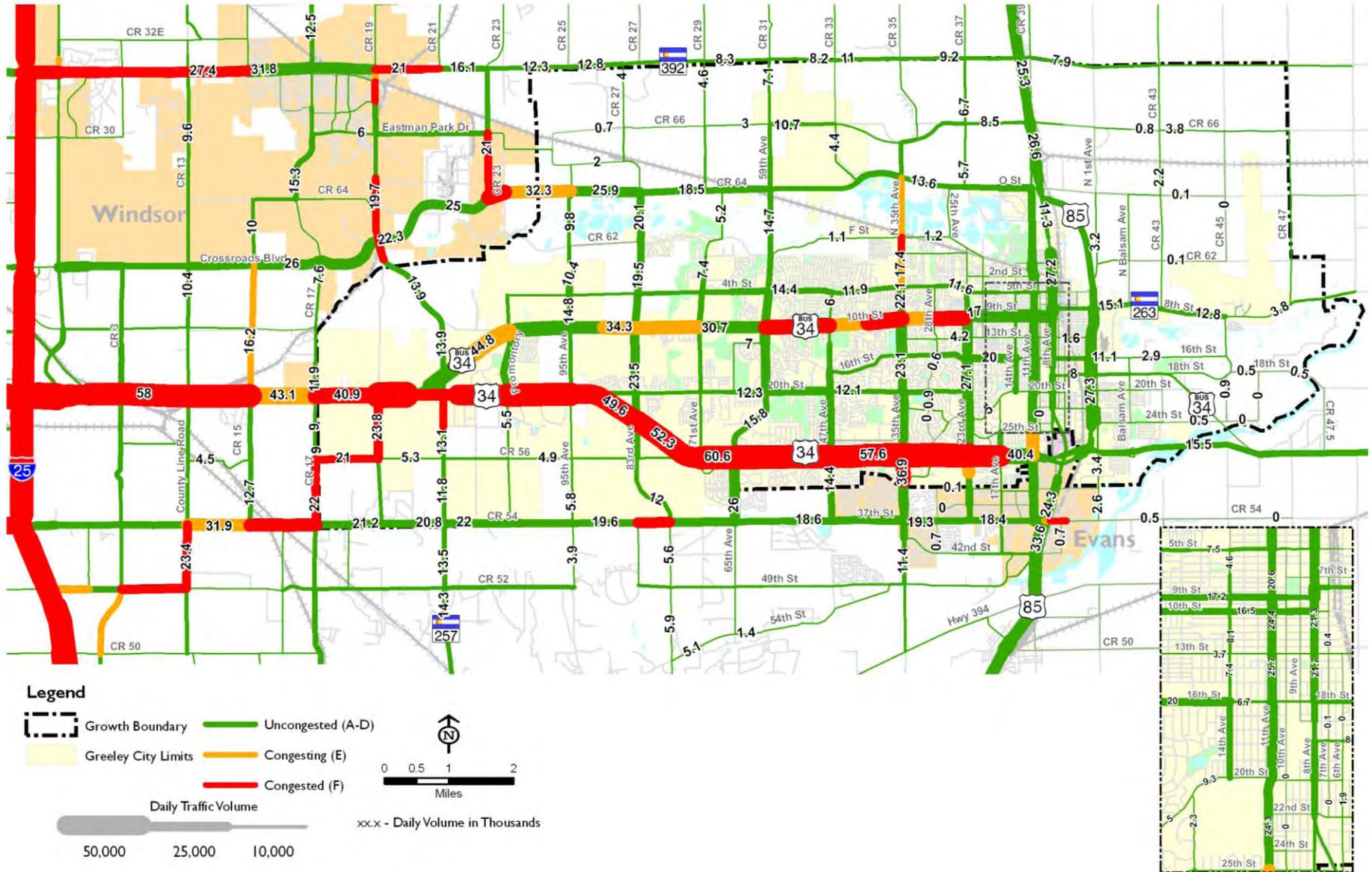


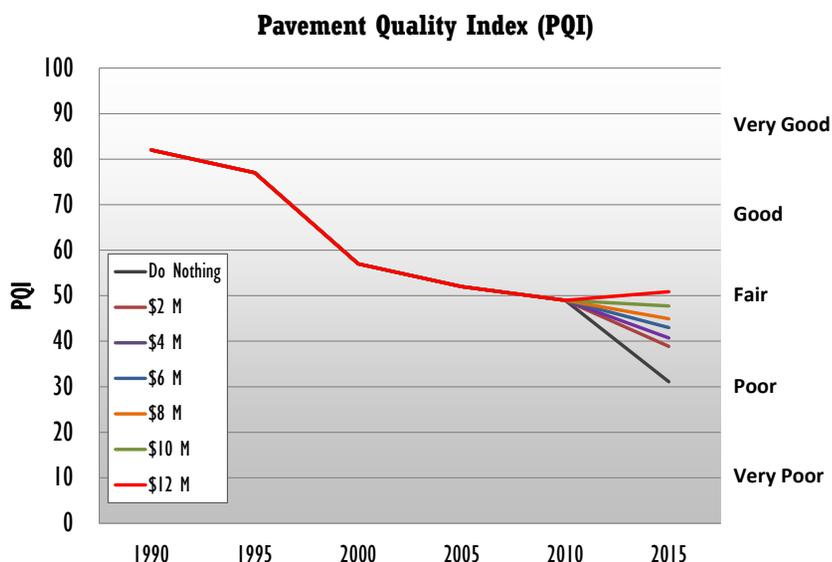
Figure 5-4: 2035 Daily Traffic Volumes and Congestion Map



Street Maintenance

As presented in Chapter 2: Existing Transportation Conditions, the condition of the City of Greeley’s streets has deteriorated from very good in 1989 to only fair in 2009. As presented in the Figure 5-5, if the City of Greeley continues to fund street maintenance at the annual average rate of \$3 million per year, the City’s street conditions will be in the poor range, approaching very poor by the 2035 plan year horizon.

Figure 5-5: Greeley Street Pavement Quality Index by Funding Level and Year



With a very modest pavement quality index target of 70, the current trend is unacceptable. Furthermore, because of the lack of an adequate maintenance budget in the past which has led to the accelerated deterioration, it will now take more per year to turn the trend around and get back to an acceptable level.

Based on Figure 5-5, the current annual \$3 million being spent on maintenance would need to be increased to \$12 million a year to return the streets to the condition that once existed.

Transit Funding and Alternatives

As presented in Chapter 4, the Transit Vision Plan is based on the Preferred Long Term Alternative from the Greeley Strategic Transit Plan. The Transit Vision Plan provides annually 60,000 fixed-route service hours, which is about average for urbanized areas with the projected population of the City of Greeley. An additional 20,000 hours of paratransit service were also included.

The Preferred Long-Term Alternative would require a substantial increase in local funding over current levels. If FTA operating funds are lost because the City exceeds the threshold for FTA small urban area operations funding, the local City matching fund requirement would be \$3,125,000 annually. This estimate considers the \$475,000 received for fares, advertising, and the UNC contract.

FTA funding may potentially be reduced after the 2010 Census is tabulated and, if not, after the 2020 Census. To address this, two reduced transit funding alternatives were developed, a moderate transfer service, and low transit service.

Moderate Transit Service Alternative

The Moderate Transit Service Alternative generally maintains a status quo level of service. Annually, 26,000 fixed-route service hours and 14,000 paratransit service hours are operated, weekdays only. The Moderate Transit Service Alternative would have basically the same route structure and coverage area that exists today. In reality, this plan would be a reduction in service since the population will have doubled without any increase in transit service.

This Moderate Transit Service Alternative would require either a continuation of FTA funding for operations or an increased local contribution. While this alternative is based on current levels of funding for both local and FTA dollars, the cost of service will increase over time, so some additional funding will be required to cover inflationary cost increases.

Low Transit Service Alternative

The Low Transit Service Alternative is the worst-case alternative, and assumes that FTA funding is limited to capital and no additional City funding from Greeley or Evans is available for public transit services.

With reduced funding, the existing fixed-route service would be eliminated and all transit service would be limited to six demand-response vehicles. This would include 16,000 annual hours of demand-response service operating weekdays only. It is likely that the service would need to be constrained to general corridors, flexible routes, or service routes in order to provide the most trips and highest productivity, given limited transit resources.

It is recognized that this service level would not be adequate to carry the existing trips that community members take via transit.

Characteristics of Alternatives

Table 5-2 identifies some of the basic characteristics of the three alternatives. Operating costs are in 2010 dollars. Ridership estimates for the Low Service Level equates to 4.7 riders per hour. Ridership for the Moderate alternative is based on 2009 ridership. Ridership for the Vision alternative is based on the Greeley Strategic Transit Plan, but was increased to reflect the fixed-route ridership increase that occurred in the last five years. The Transit Vision Plan Service Level provides the level of ridership that is most appropriate for the size of the urbanized area in 2035, but it may require a substantial increase in local funding.

Transportation Funding Options

The City of Greeley is in very difficult financial times. Transportation impact fees are insufficient to build the necessary streets to accommodate forecast growth.

FTA transit operating funding is in jeopardy and may be reduced, and the City might have to spend more funds to keep existing service. In reality, the existing transit service would be half the transit service per capita with a doubling in population as compared to today.

Funding for maintenance at an annual average of \$4 million is not sustainable because streets will deteriorate to poor or very poor levels.

Table 5-2: Characteristics of Transit Alternatives

Characteristic	Vision Plan Service Level		Moderate Service Level		Low Service Level	
	Fixed-Route	Paratransit	Fixed-Route	Paratransit	No Fixed-Route Service	Demand Response
Annual Service Hours	60,000	20,000	26,000	14,000		16,000
Service Hrs /Capita	0.27	0.09	0.12	0.06		0.07
Peak Buses	20	8	10	6		7
Ridership ⁽¹⁾	913,000	49,000	450,000	26,000		75,000
Operating Costs ⁽²⁾	\$3,600,000	\$1,200,000	\$1,560,000	\$840,000		\$1,040,000
Total Operating Costs	\$4,800,000		\$2,400,000		\$1,040,000	

(1) Ridership estimates for Moderate Service Level are based on 2009 ridership. The ridership for the Vision Service Levels was updated from the Greeley Strategic Transit Plan to reflect the ridership increases that have occurred in the last five years.

(2) Operating costs are calculated at \$60 per hour for Moderate and Vision Service Levels. They are calculated at \$65 per hour for the Low Service Level since fixed costs would be proportionally higher than the other alternatives.

Typically, the City has tried to increase funding of capital projects from general revenue (largely sales tax). The reality is that the City must consider other ways to fund the critically needed transportation improvements and maintain the existing transportation system. This provides an opportunity to consider how to address funding needs for roadways, transit, and non-motorized modes. Increasing transportation impact fees to accommodate new growth is a first step in order to avoid falling further behind. A second recommendation would be to institute a street maintenance fee.

Transportation Safety

A major goal of the City of Greeley 2035 Comprehensive Transportation Plan is to provide for a multi-modal transportation system that safely and efficiently moves people and goods to, through, and within the City of Greeley. To assure success in achieving this goal, the Plan recommends the following.

- Use current technologies (e.g., GIS and web-based systems). These technologies help to provide more timely and accurate information, especially in the areas of data collection and analysis.
- Develop community-based traffic safety programs. Community-based programs help to elevate the importance of safety at the community and higher levels.
- Coordinate traffic records to ensure the timeliness, accuracy, and linkage of data. This need is critical for determining where efforts should be focused. Considerable efforts are being made to reduce the period of time between when crashes occur and when the data is made available for use in automated systems.
- Select hazardous locations for corrective action based on several factors. While there were a number of variations for

selecting “sites with promise,” the most common factors were combinations of crash frequency, rate, and severity.

Transportation Policies and Actions

The following policies are intended to guide the City of Greeley toward achieving the goals of the 2035 Transportation Plan. They cover general, as well as specific, areas related to transportation planning. Upon adoption of the City of Greeley 2035 Comprehensive Transportation Plan, these policies become official statements of intent that set a course of action for the City with regard to future transportation planning and improvements. These policies will be used to review the transportation aspects of all development projects. In order to progress with the plan, each policy is accompanied with implementation actions.

General

Policy Statement: In order to provide a transportation system that is functional, safe, and efficient, and which is compatible with the natural, social, and economic environment, the transportation system must be designed to encourage the use of all modes of travel.

Actions:

- Adopt the 2035 Comprehensive Transportation Plan as an element of the City’s 2060 Comprehensive Plan.
- Incorporate the North Front Range Regional 2025 Transportation Plan as an element of the City’s 2035 Transportation Plan.
- Continue to work cooperatively with Weld County, CDOT, NFRT & AQPC, UNC, AIMS and other jurisdictions, agencies and the transportation industry on land use and transportation related programs and projects, including an on-going review of

agency policies which affect the overall City transportation system.

- Require that all development projects (including redevelopment and infill projects), to the extent possible, comply with the intent of the standards in the 2035 Transportation Plan.

Land Use

Policy Statement: In order to achieve a transportation system that supports planned land uses and facilitates the movement of people, goods, and services in an effective and desirable manner, attention must be focused on ensuring that land uses, transportation decisions, strategies, and investments are balanced, coordinated, and complementary in achieving overall community development goals.

Actions:

- Continue to work cooperatively with Weld County, CDOT, NFRT & AQPC, UNC, AIMS, and other jurisdictions, agencies, and the transportation industry on land use and transportation-related programs and projects, including an ongoing review of agency policies which affect the overall city transportation system.
- Investigate the development of a package of incentives or standards for the City's Development Code, such as reduced parking standards, increased density, and mixed land uses, to encourage mixed use development and activity areas along planned transit corridors.
- Develop standards and incentives for the City's Development Code to encourage higher density, mixed-use, and in-fill developments that are pedestrian-oriented.

- Develop incentives for the City's Development Code to encourage new development concepts such as cluster and neo-traditional development, which promote more compact development types.
- Continue to refine traffic impact study guidelines that require the identification of development-related transportation impacts, as well as improvements and/or necessary mitigation steps to address impacts.

Roadway

Policy Statement: In order to enhance community appeal, provide pleasing, safe and efficient travel corridors, limit infrastructure cost, citizen education, and support environmental objectives, the City will design roads and other transportation facilities in such a way as to contribute to a positive and attractive visual image and community character.

Actions:

- Update the transportation fee program to a level at which new development pays its own way.
- Continue to emphasize maintenance of the existing transportation system and pursue a street maintenance fee.
- Develop street design standards that are responsive to new development trends while meeting the intent of the street design standards.
- Improve the management of hazardous material transportation through the community.
- Promote coordination and cooperation in roadway planning in the community and throughout the region.

- Adopt the Street Functional Classification Map (Year 2035 Greeley Master Streets Plan) as an element of the City's 2060 Comprehensive Plan.
- Evaluate traffic signal operation on a regular basis, including signal timing plans, left-turn phasing, and clearance intervals, and consider increasing number of activated and coordinated signal systems.
- Require the dedication of right-of-way for future roadways.
- Promote Intelligent Transportation Systems to gain the maximum capacity and traffic flow out of the existing transportation system.

Transit

Policy Statement: An efficient public transit service will be operated in order to provide mobility and access to community services, employment, educational opportunities, shopping, medical and other destinations; and to provide residents who are limited in mobility due to age, income, or ability (with support) to be as self-reliant as possible.

Actions:

- Continue to provide funding for a transit system that provides a choice and serves those who are transit dependent, including youth, those with disabilities, and the growing senior population.
- Develop and incorporate transit standards for future mixed-use activity centers and along multi-modal corridors.
- Develop a long-term funding strategy once the status of the FTA urbanized area funds is known. Based on community support for the transit mode, match funding and service levels to establish a viable long-term plan for local and regional transit services.

- Work with regional partners to support development of inter-city and regional bus service.
- Increase funding for new routes or increase frequencies on existing routes.
- Support regional efforts for inter-city and regional bus service.

Bicycle

Policy Statement: Encourage bicycle travel through the development of an effective bikeway system and by constructing on-street bike lanes, off-street bike trails, and shared-use paths, per the Transportation Plan.

Policies:

- Adopt the Bicycle Vision Plan as an element of the City's 2060 Comprehensive Plan.
- Identify critical bicycle maintenance and improvement projects as part of the annual Capital Improvement Plan.
- Review and update the Bike Plan every three years, including general alignments of routes in areas expected to develop in the future.
- Provide a continuous bicycle route system.
- Reserve or acquire right-of-way for future bikeways as development of new areas is planned.
- Evaluate the potential to retrofit bikeways into the existing street system, including road diets and reduced travel lanes.

- Continue to work cooperatively with Weld County, CDOT, NFRT & AQPC, UNC, Evans, Windsor, AIMS and other jurisdictions, agencies and area bicyclists on dedication of adequate right-of-way for bicycle use on projects and improvements, including an ongoing review of agency policies which affect the overall city transportation system.
- Seek implementation opportunities through enhancement programs, other grants, and donations, etc.
- Educate public on bicycle awareness and pedestrian safety.
- Develop public outreach programs to raise awareness of bicycle safety.
- Continue to work cooperatively with Weld County, CDOT, NFRT & AQPC, UNC, AIMS, and other jurisdictions and agencies, on dedication of adequate right-of-way for pedestrian use on projects and improvements, including an ongoing review of agency policies which affect the overall City transportation system.
- Educate public on pedestrian awareness and pedestrian safety.
- Develop public outreach programs to raise awareness of pedestrian safety.

Pedestrian

Policy Statement: Require all new development and public infrastructure improvements to include best practices pedestrian design standards and implementation.

- Promote coordination and cooperation on pedestrian projects and improvements in the community and throughout the region.
- Identify critical pedestrian maintenance and improvement projects as part of the annual Capital Improvement Plan.
- Incorporate pedestrian circulation standards and guidelines into the City's Subdivision Regulations and Development Code.
- Identify key gaps in sidewalk network and include funding in annual Capital Improvements Program for these areas.